

Service Manual

Multi-Function Laser FAX

KX-FLM600G

(for Germany)



Panasonic

©1999 Kyushu Matsushita Electric Co., Ltd.
All rights reserved. Unauthorized copying and distribution is a violation of law.

When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.

TABLE OF CONTENTS

	Page
INTRODUCTION	
Safety Precautions	5
Insulation Resistance Test	5
For Service Technicians	5
Battery Caution	5
AC Caution	6
Personal Safety Precautions	6
Service Precautions	8
Features	8
Specifications	9
Optional Accessories	9
Printer Feature	10
Scanner Feature	10
CCITT No.1 Test Chart	12
Location of Controls	13
Connections	15
Installation	16
Maintenance Items and Component Locations	25
TROUBLESHOOTING GUIDE	
Troubleshooting Summary	29
User Recoverable Errors	30
Troubleshooting Details	34
PANALINK	108
Programming and Lists	117
Test Functions	130
ADJUSTMENTS	
Shading	136
High Voltage Value Check	143
DISASSEMBLY INSTRUCTIONS	
Disassembly Instructions	146
How to Replace the Flat Package IC	161

LBP PROSESS OPERATION

PCB Location	164
Printer Operation Principle	165
Electric Operation Principle	166
Rollers Operation	167
Printing Operation Principle	169

CIRCUIT OPERATIONS

Connection Diagram	177
General Block Diagram	179
Fax Control Section	185
Printing Contoroller Section	210
Engine Section	222
Sensors and Switches Section	229
H.V.P.S. Section	236
Operation Board Section	241
LCD Section	242
Power Supply Board Switching Section	243
PRINTED CIRCUIT BOARD / SCHEMATIC DIAGRAM (HOOK SWITCH)	247
PRINTED CIRCUIT BOARD / SCHEMATIC DIAGRAM (DIGITAL)	248
PRINTED CIRCUIT BOARD / SCHEMATIC DIAGRAM (ANALOG)	250
PRINTED CIRCUIT BOARD / SCHEMATIC DIAGRAM (OPERATION)	252
PRINTED CIRCUIT BOARD (PRTINTER CONTROL)	254
SCHEMATIC DIAGRAM (PRINTER CONTROL)	255
PRINTED CIRCUIT BOARD (ENGINE / SENSORS)	260
SCHEMATIC DIAGRAM (ENGINE)	261
SCHEMATIC DIAGRAM (SENSORS)	263
PRINTED CIRCUIT BOARD (H.V.P.S)	264
SCHEMATIC DIAGRAM (H.V.P.S)	265
PRINTED CIRCUIT BOARD (S.M.P.S.)	267
SCHEMATIC DIAGRAM (S.M.P.S.)	268
FIXTURES AND TOOLS	269
CABINET,MECHANICAL AND ELECTRICAL PARTS LOCATION	270
ACCESSORIES AND PACKING MATERIALS	277
REPLACEMENT PARTS LIST	278
EXPLANATION OF CD-ROM SERVICE NUMBER	289

INTRODUCTION

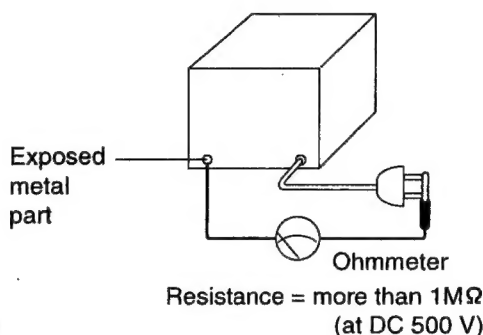
	Page
Safety Precautions	5
Insulation Resistance Test	5
For Service Technicians	5
Battery Caution	5
AC Caution	6
Personal Safety Precautions	6, 7
Service Precautions	8
Features	8
Specifications	9
Optional Accessories	9
CCITT No.1 Test Chart	12
Location of Controls	13, 14
Connections	15, 16
Installation	17~24
Maintenance Items and Component Locations	25~27

SAFETY PRECAUTIONS

1. Before servicing, unplug the AC power cord to prevent an electric shock.
2. When replacing parts, use only the manufacturer's recommended components.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to perform the following insulation resistance test to prevent the customer from being exposed to shock hazards.

INSULATION RESISTANCE TEST

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part (screwheads, control shafts, bottom frame, etc.).
Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard.
The equipment should be repaired and rechecked before it is returned to the customer.



FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help prevent recurring malfunctions.

- 1) Cover the plastic part's boxes with aluminum foil.
- 2) Ground the soldering irons.
- 3) Use a conductive mat on the worktable.
- 4) Do not touch the IC or LSI pins with bare fingers.

BATTERY CAUTION

CAUTION

Danger of explosion if the battery is replaced incorrectly. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to following caution:

Disposal of lithium batteries should be performed by permitted, professional disposal firms knowledgeable in state government federal and local hazardous materials and hazardous waste transportation and disposal requirements. A battery continues to have no transportation limitations as long as it is separated to prevent short circuits and packed in strong packaging.

Commercial firms that dispose of any quantity of lithium cells should have a mechanism in place to account for their ultimate disposition. This is a good practice for all types of commercial or industrial waste.

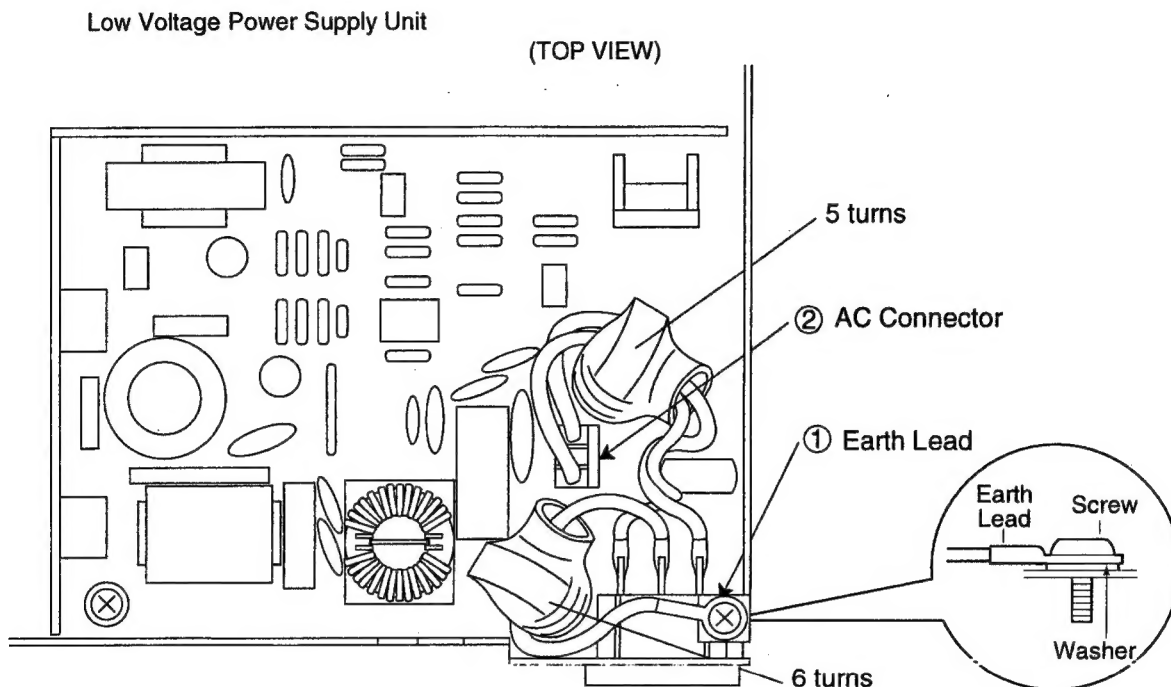
Recommend Type Number: CR2032 (BATT)
CR2032 (BATT)

Manufactured by MATSUSHITA
Manufactured by SONY

AC CAUTION

For safety, before closing the main cabinet, please make sure of the following precautions.

- ① The earth lead is fixed with the screw.
- ② The AC connector is connected properly.
- ③ Wind coils 5 turns or 6 turns respectively.

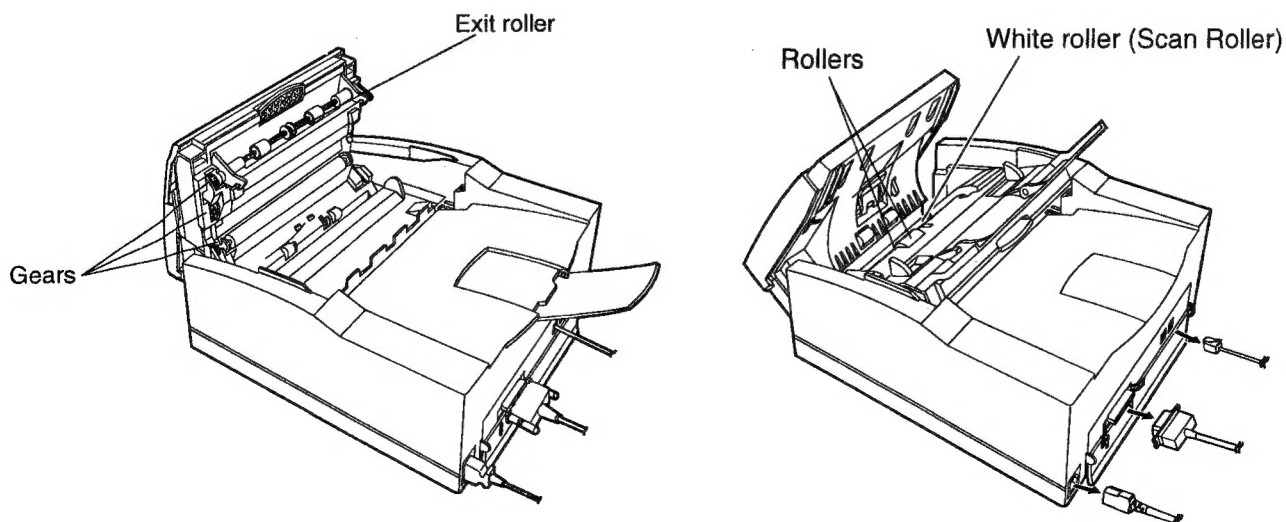


PERSONAL SAFETY PRECAUTIONS

1. MOVING SECTIONS OF THE UNIT

Be careful not to let your hair, clothes, fingers, accessories, etc., become caught in any moving sections of the unit.

The moving sections of the unit are the rollers and gears. There is a separation roller and a document feed roller which are rotated by the motor. A gear rotates the related rollers. Be careful not to touch them with your hands, especially when the unit is operating.



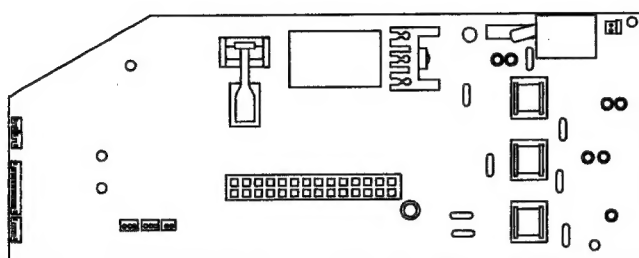
2. LIVE ELECTRICAL SECTIONS

All the electrical sections of the unit supplied with AC power by the AC power cord are live.
Never disassemble the unit for service with the AC power supply plugged in.

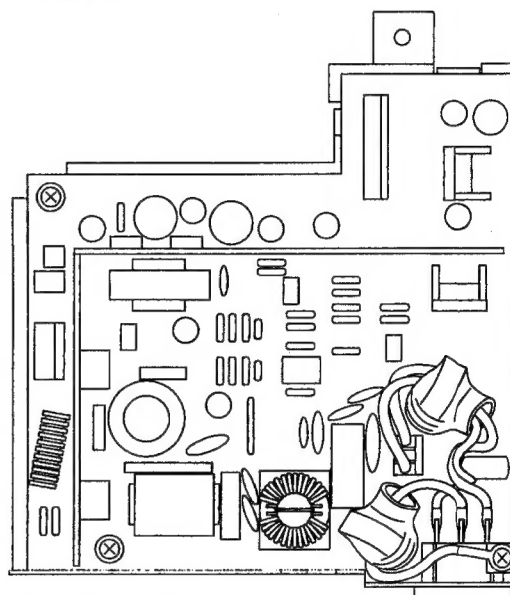


AC voltage is supplied to the primary side of the power supply unit.
Therefore, always unplug the AC power cord before disassembling for service.

Be careful of "High Voltage" in these areas.



High Voltage Power Supply Board



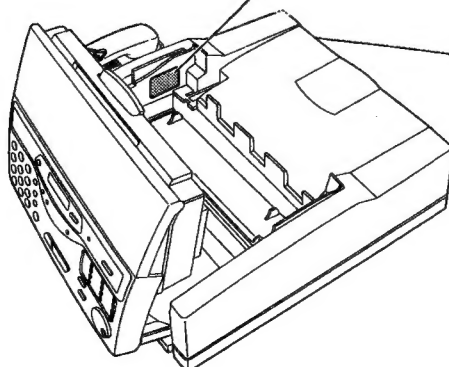
Low Voltage Power Supply Board

3. LASER BEAM SECTION

CAUTION:

- This unit utilizes a laser. Use of controls or adjustments or performance of procedures other than those specified here in may result in hazardous radiation exposure.

<p>DANGER: Invisible laser radiation when open and interlock defeated. AVOID DIRECT EXPOSURE TO BEAM.</p> <p>VORSICHT: Unsichtbare Laserstrahlung, wenn Abdeckung geöffnet und Sicherheitsverriegelung überbrückt. NICHT DEM STRAHL AUSSETZEN.</p>	<p>ATTENTION: Rayonnement laser invisible dangereux en cas d'ouverture et lorsque la sécurité est neutralisée. EXPOSITION DANGEREUSE AU FAISCEAU.</p> <p>PELIGRO: Cuando se abre y se invalida el bloqueo, se producen radiaciones invisibles de láser. EVITESE LA EXPOSICIÓN A TALES RAYOS.</p>	<p>PFQT1577ZA</p>
--	--	-------------------



CLASS 1 LASER PRODUCT
KLASSE 1 LASER PRODUKT
CLASSE 1 LASER PRODUIT
CLASE 1 LÁSER PRODUCTO

SERVICE PRECAUTIONS

PRECAUTIONS TO PREVENT DAMAGE FROM STATIC ELECTRICITY

Electrical charges accumulate on a person. For instance, clothes rubbing together can damage electric elements or change their electrical characteristics. In order to prevent static electricity, touch a metallic part that is grounded to release the static electricity. Never touch the electrical sections such as the power supply unit, etc.

FEATURES

General

- Help function
 - Display: 1. Einstellungen
 - 2. Jog/Autowahl
 - 3. Fax Empfangen
 - 4. Kopierer
 - 5. Berichte
- LCD (Liquid Crystal Display) readout

Laser Printer function

- Fast 8ppm Printing
- 600x600 dpi Printer Resolution
- Windows 3.1/3.11/95/98/Ready GDI*** Printer Driver.

PC fax

- Send and Receive Faxes from your PC.
- Compatible with Windows 95/98 only

*** Graphics Device Interface

Plain Paper Facsimile Machine

- 9 second transmission speed *
- 15 second transmission speed **
- Letter/Legal, G3 compatible
- Resolution : 64 level
- Delayed transmission
- Overseas transmission function
- Remote FAX receiving using an extension phone
- Out of paper reception
- * The 9 second speed is based upon the CCITT No. 1 Test Chart on the condition that memory transmission is performed.
- ** The 15 second speed is based upon the CCIT No. 1 Test Chart.

Memory Capacity

Approx. 120 pages of memory transmission/reception/copy
(Based on the CCITT No. 1 Test Chart in standard resolution.)

Integrated Telephone System

- On-hook dialing
- Monitorphone
- One-Touch dial (11x2 Phone Numbers)
- 100-Station telephone directory with *Jog Dial*

Copier function

- Enlargement and reduction
- Collate
- 64-Level halftone

PC-Scanner

- 400dpi (interpolated) scanning capability
- Easy to use document Viewer
- Compatible with Windows 95/98
- Windows 3.1/3.11(Need application software which is compatible with TWAIN driver.)

Trademarks

IBM is a registered trademark of International Business Machines Corporation.

Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.

All other trademarks identified herein are the property of their respective owners.

SPECIFICATIONS

Applicable Lines:	Public Switched Telephone Network
Document Size:	Max. 216mm(8.5") in width Max. 600mm(23 5/8") in length
Effective Scanning Width:	208mm(8 3/16")
Recording Paper Size:	A4: 210mmx297mm
Effective Printing Size:	208mm(8 3/16")
Transmission Time*1:	Approx. 8sec./page (ECM-MMR)*2
Scanning Density:	Horizontal: 8pels/mm (203pels/inch) Vertical: 3.85lines/mm (98lines/inch)-STANDARD mode 7.7lines/mm (196lines/inch)-FINE/HALF TONE mode 15.4lines/mm (392lines/inch)-SUPER FINE mode
Halftone Level:	64-level
Scanner Type:	CIS(Contact Image Sensor)
Printer Type:	Laser Beam Printing
Data Compression System:	Modified Huffman (MH), Modified READ (MR), Modified Modified READ (MMR)
Modem Speed:	14,400/12,000/9,600/7,200/4,800/2,400 bps; Automatic Fallback
Operation environment:	10-32.5°C (50-90.5°F), 20-80 %RH(Relative Humidity)
Dimensions(HxWxD):	422x430x212mm (16 5/8x16 15/16x8 11/32")
Mass(Weight):	Approx. 12.2kg (26.9 lb.)
Power Consumption:	Standby: Approx. 40W Power save*3: Approx. 10W Transmission: Approx. 12W (Power save) Approx. 42W (Standby) Print(Copy or Reception): Approx. 200W Maximum: Approx. 480W
Power Supply:	220V-240V AC, 50Hz
Memory Capacity:	Fax memory: Approx. 120pages memory transmission and reception (Based on CCITT No.1 Test Chart in standard resolution)

*1 Transmission speed depends upon the contents of the pages, resolution, telephone line conditions and capability of the receiving unit.

*2 The 8 second speed is based upon the CCITT No.1 Test Chart.

*3 If this product is not used for 5 minutes, it will change to power save mode.

Design and specifications are subject to change without notice.

OPTIONAL ACCESSORY

Parts No.	Description	Specifications
KX-FA75X	Toner cartridge and drum unit	1 toner cartridge and 1 drum unit

PRINTER FEATURE

Printer Type: Laser beam printer
Printer Speed: 8 ppm
Compatible OS: Windows 3.1/3.11/95/98
Interface: 8-bit parallel (Included)
Paper specifications:
Media Size: Using the paper cassette

paper

Media	Size	Dimension
Paper	A4	210mmX297mm

Using the paper tray

Media	Size	Dimension
Paper	Letter	216 mm X 279 mm (8 1/2" X 11")
	Legal	216 mm X 356 mm (8 1/2" X 14")
	A4	210 mm X 297 mm
	Executive	184 mm X 267 mm (7 1/4" X 10 1/2")
Transparency	Letter	216 mm X 279 mm (8 1/2" X 11")
	A4	210 mm X 297 mm
*Envelope	COM10	105 mm X 241 mm (4 1/8" X 9 1/2")
	DL	110 mm X 220 mm

Paper Weight: Using the paper cassette
 60 g/m² to 90 g/m² (16 lb. to 24 lb.)
 Using the paper tray (manual feed)
 60 g/m² to 105 g/m² (16 lb. to 28 lb.)

- * • A thin, sharply creased leading edge
- Paper weight of 75 g/m² (20 lb.)
- Flat, free of curls, wrinkles, nicks, etc.
- No cotton and/or fiber material included

Note:

- Fax receiving and copying are only available when using the paper cassette.

SCANNER FEATURE

Document Size: Max. 216 mm (8 1/2") in width
 Max. 600 mm (23 5/8") in length
Effective Scanning Width: 208 mm (8 3/16")
Scanning Density: Standard 100 X 200 DPI } **Note:**
 Fine 200 X 200 DPI } • It can be changed by the soft setting.
 S-Fine 200 X 400 DPI }
Halftone Level: 64-level
Scanner Type: CIS (Contact Image Sensor)
Compatible OS: Windows 95/98
 Windows 3.1/3.11 (Need application software which is compatible with TWAIN driver.)

Note:

- Any details given in these instructions are subject to change without notice.
- The pictures and illustrations in these instructions may vary slightly from the actual product.

Toner life

Toner life of the included toner cartridge or KX-FA75X toner cartridge depends on the amount of content in a received, copied or printed document. We refer to the content as "image area". Because image area varies in actual usage, so does toner life. The following is the approximate relationship between image area and toner life for the included toner cartridge or KX-FA75X toner cartridge.

● Toner life for the included toner cartridge or KX-FA75X toner cartridge:

5% image area

Specifications	
Main unit specifications	
1. Application Area:	Public, business telephone network
2. Effective Printing Width:	110-19.00
3. Effective Printing Width:	110-19.00
4. Effective Printing Width:	110-19.00
5. Effective Printing Width:	110-19.00
6. Effective Printing Width:	110-19.00
7. Effective Printing Width:	110-19.00
8. Effective Printing Width:	110-19.00
9. Effective Printing Width:	110-19.00
10. Effective Printing Width:	110-19.00
11. Effective Printing Width:	110-19.00
12. Effective Printing Width:	110-19.00
13. Effective Printing Width:	110-19.00
14. Effective Printing Width:	110-19.00
15. Effective Printing Width:	110-19.00
16. Effective Printing Width:	110-19.00
17. Effective Printing Width:	110-19.00
18. Effective Printing Width:	110-19.00
19. Effective Printing Width:	110-19.00
20. Effective Printing Width:	110-19.00

10% image area

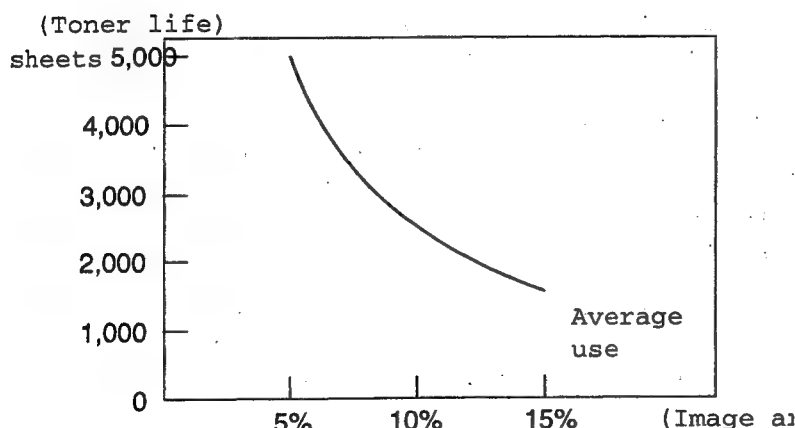
Specifications	
Main unit specifications	
1. Application Area:	Public, business telephone network
2. Effective Printing Width:	110-19.00
3. Effective Printing Width:	110-19.00
4. Effective Printing Width:	110-19.00
5. Effective Printing Width:	110-19.00
6. Effective Printing Width:	110-19.00
7. Effective Printing Width:	110-19.00
8. Effective Printing Width:	110-19.00
9. Effective Printing Width:	110-19.00
10. Effective Printing Width:	110-19.00
11. Effective Printing Width:	110-19.00
12. Effective Printing Width:	110-19.00
13. Effective Printing Width:	110-19.00
14. Effective Printing Width:	110-19.00
15. Effective Printing Width:	110-19.00
16. Effective Printing Width:	110-19.00
17. Effective Printing Width:	110-19.00
18. Effective Printing Width:	110-19.00
19. Effective Printing Width:	110-19.00
20. Effective Printing Width:	110-19.00

15% image area

Specifications	
Main unit specifications	
1. Application Area:	Public, business telephone network
2. Effective Printing Width:	110-19.00
3. Effective Printing Width:	110-19.00
4. Effective Printing Width:	110-19.00
5. Effective Printing Width:	110-19.00
6. Effective Printing Width:	110-19.00
7. Effective Printing Width:	110-19.00
8. Effective Printing Width:	110-19.00
9. Effective Printing Width:	110-19.00
10. Effective Printing Width:	110-19.00
11. Effective Printing Width:	110-19.00
12. Effective Printing Width:	110-19.00
13. Effective Printing Width:	110-19.00
14. Effective Printing Width:	110-19.00
15. Effective Printing Width:	110-19.00
16. Effective Printing Width:	110-19.00
17. Effective Printing Width:	110-19.00
18. Effective Printing Width:	110-19.00
19. Effective Printing Width:	110-19.00
20. Effective Printing Width:	110-19.00

Note:

- The image area changes with the depth, thickness and size of the characters in the document.



Note:

- Toner life will vary depending on actual usage.

Drum life

The included drum unit or KX-FA75X drum unit can print approx. 5,000 sheets of letter size paper regardless of the content of image area.

CCITT NO. 1 TEST CHART (Actual size)



THE SLEREXE COMPANY LIMITED

SAPORS LANE - BOOLE - DORSET - BH 25 8 ER

TELEPHONE BOOLE (945 13) 51617 - TELEX 123456

Our Ref. 350/PJC/EAC

18th January, 1972.

Dr. P.N. Cundall,
Mining Surveys Ltd.,
Holroyd Road,
Reading,
Berks.

Dear Pete,

Permit me to introduce you to the facility of facsimile transmission.

In facsimile a photocell is caused to perform a raster scan over the subject copy. The variations of print density on the document cause the photocell to generate an analogous electrical video signal. This signal is used to modulate a carrier, which is transmitted to a remote destination over a radio or cable communications link.

At the remote terminal, demodulation reconstructs the video signal, which is used to modulate the density of print produced by a printing device. This device is scanning in a raster scan synchronised with that at the transmitting terminal. As a result, a facsimile copy of the subject document is produced.

Probably you have uses for this facility in your organisation.

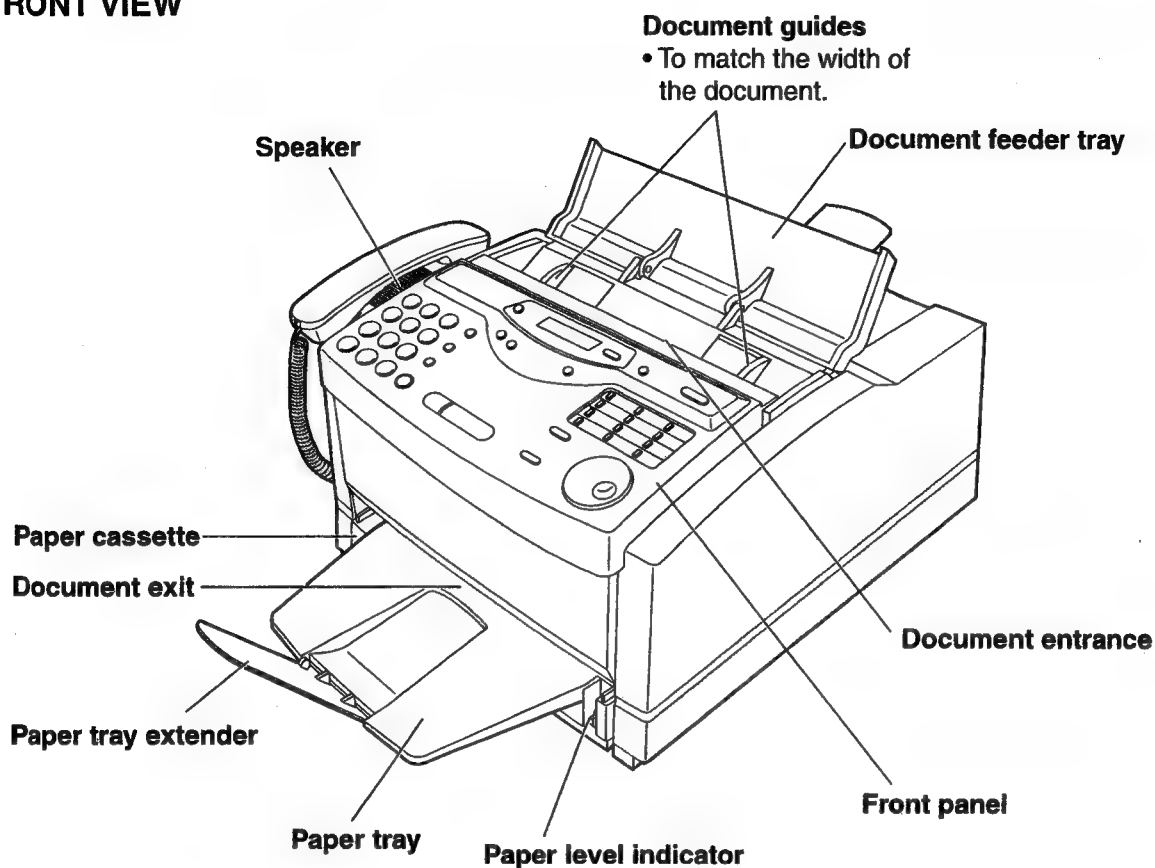
Yours sincerely,

Phil.

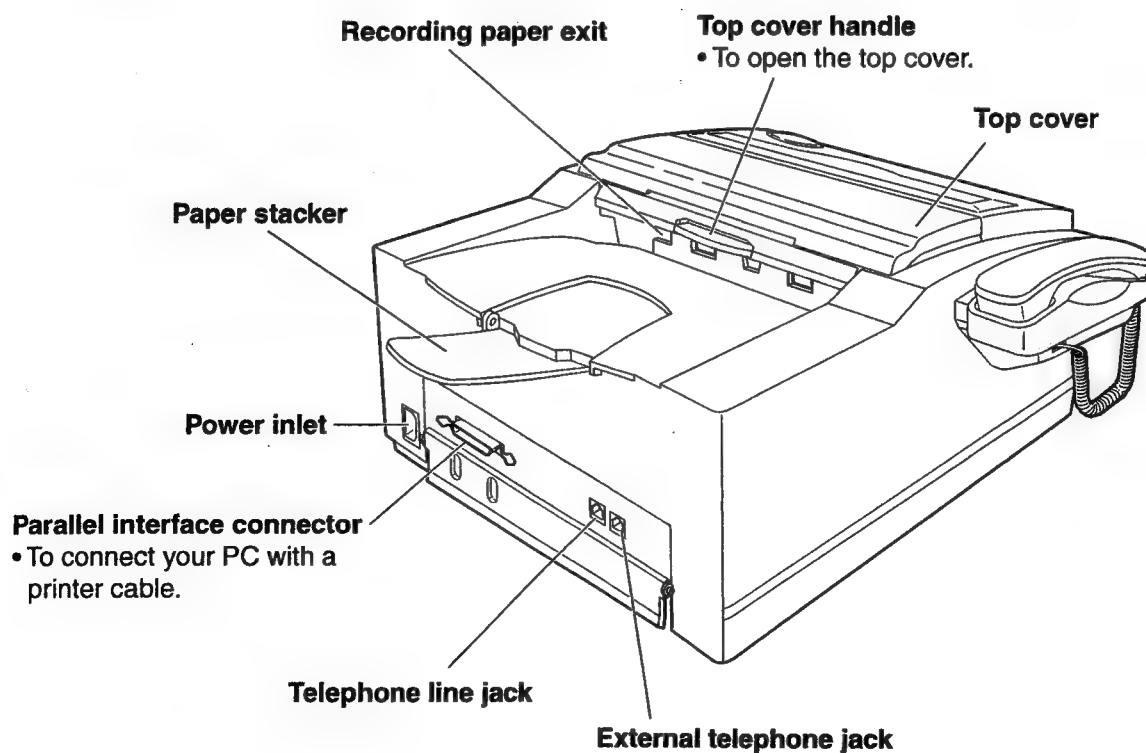
P.J. CROSS
Group Leader - Facsimile Research

LOCATION OF CONTROLS

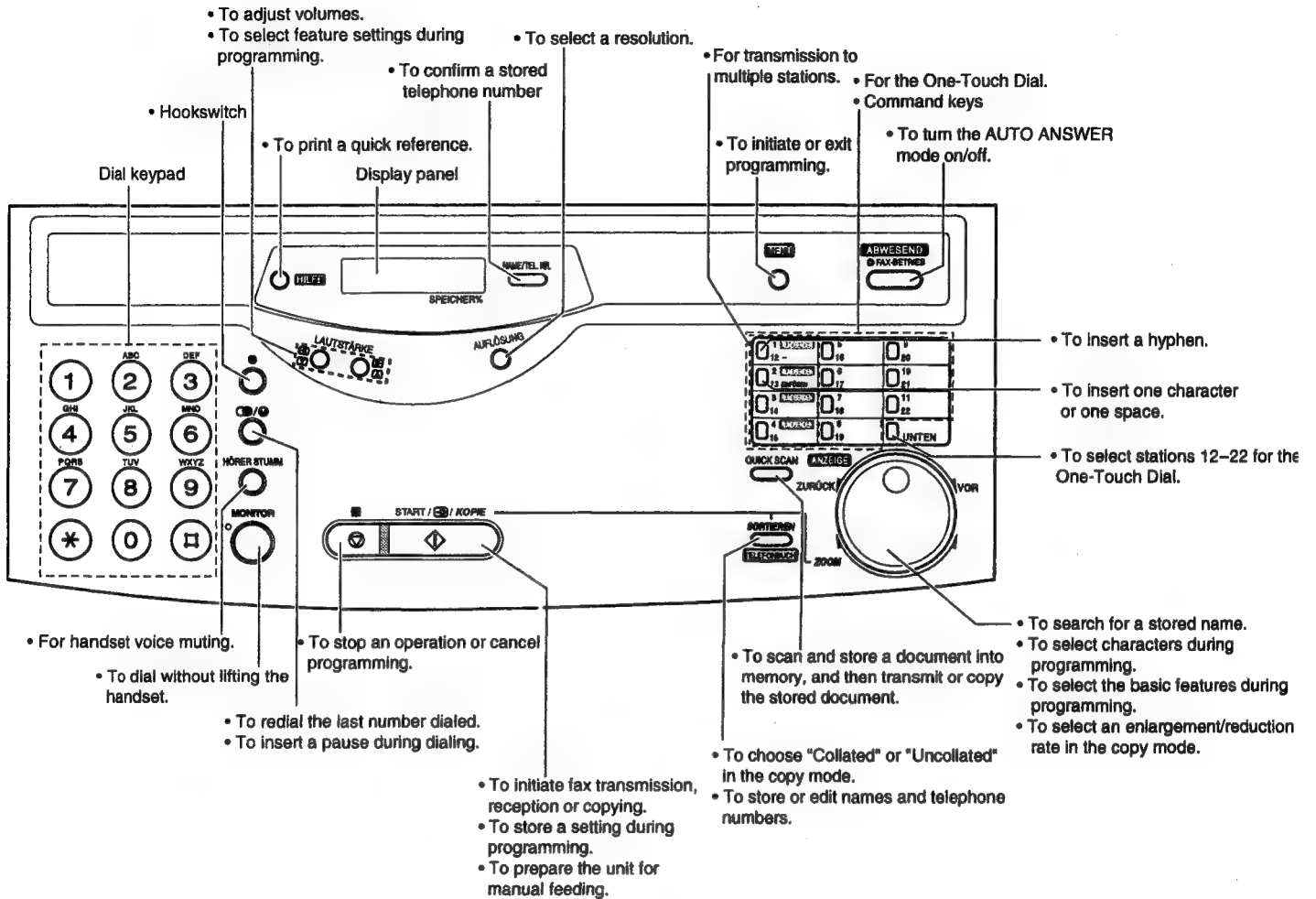
1. FRONT VIEW



2. REAR VIEW



3. CONTROL PANEL

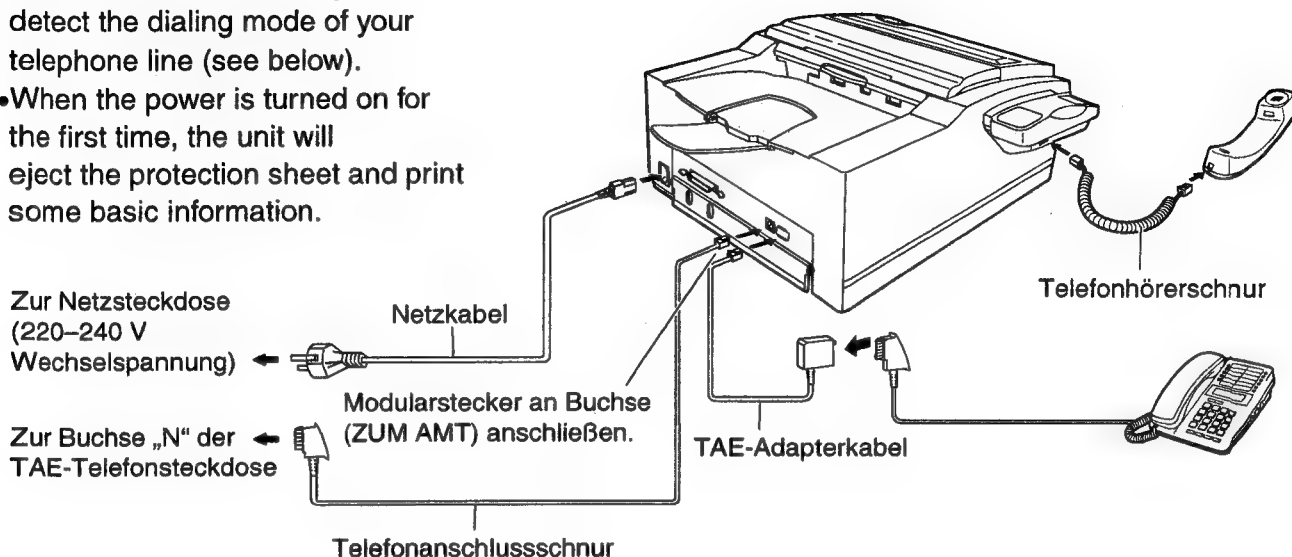


CONNECTIONS

1.CONNECTION

- 1.Connect the handset cord.
- 2.Connect the telephone line cord.
- 3.Connect the power cord.

- The unit will automatically start to detect the dialing mode of your telephone line (see below).
- When the power is turned on for the first time, the unit will eject the protection sheet and print some basic information.



Note:

- For additional equipment protection, we recommend the use of a surge protector. The following types are available; TELESPIKE BLOK MODEL TSB (TRIPPE MFG. CO.), SPIKE BLOK MODEL SK6-0 (TRIPPE MFG. CO.), SUPER MAX (PANAMAX) or MP1 (ITW LINX).
- The warranty does not cover damage due to power line surges or lightning.
- When you operate this product, the power outlet should be near the product and easily accessible.

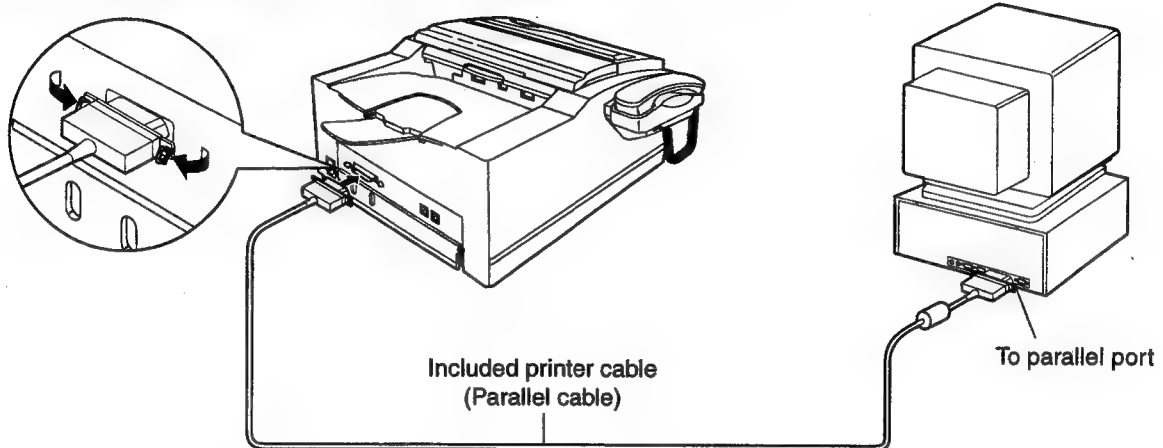
2. CONNECTING TO A COMPUTER

To run the Panasonic Multi-Function software (PANA LINK), you need the following software and hardware.

CPU:	An IBM compatible personal computer with a 486 or higher processor (Pentium is recommended.)
Basic Software:	Microsoft Windows 95 or Windows 98 (Windows 3.1/3.11*—printer driver only)
Memory Minimum:	16 MB (32 MB or more is recommended)
Hard disk:	More than 40 MB available space
Other:	Parallel port Panasonic Multi-Function fax machine

*Microsoft Windows operating system Version 3.1/3.11 (hereafter Windows 3.1/3.11)

Connect your personal computer to the fax machine as follows:



Caution:

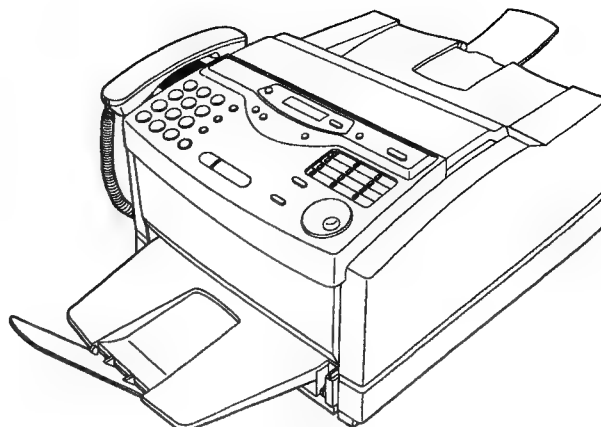
- When connecting the fax machine to your computer, use the included printer cable for reliable data communications and compliance with FCC rules.
- Do not connect the printer cable to the serial port on the computer. This may cause damage to your fax machine and computer.

INSTALLATION

1. INSTALLATION SPACE

The space required to install the unit is shown below.
The dimensions given are necessary for the unit to operate efficiently.

HxWxD: 422 mm x 430 mm x 212 mm
(without the manual feeding tray)
422 mm x 550 mm x 212 mm
(when the manual feeding tray is attached)
422 mm x 683 mm x 212 mm
(when the document tray, extra manual feeding tray or extra recording paper tray is opened)



NOTE

Avoid excessive heat or humidity.

Use the unit within the following ranges of temperature and humidity.

Ambient temperature: 5°C to 35°C

Relative humidity: 20% to 80% (without condensation)

Power cord length should be less than 5 meters (16.4 feet). Using a longer cord may reduce the voltage or cause malfunctions.

Avoid direct sunlight.

Do not install near devices which contain magnets or generate magnetic fields.

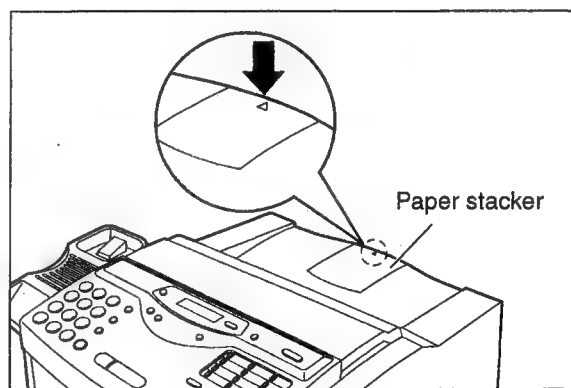
Do not subject the unit to strong physical shock or vibration.

Keep the unit clean. Dust accumulation can prevent the unit from functioning properly.

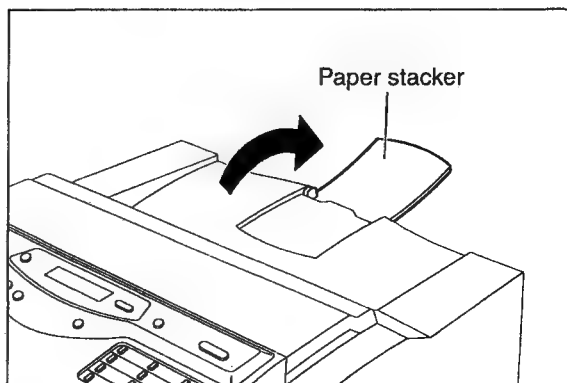
To protect the unit from damage, hold both sides when you move it.

2. INSTALLING THE PAPER STACKER

(1) Press "▽" marked area on the paper stacker.

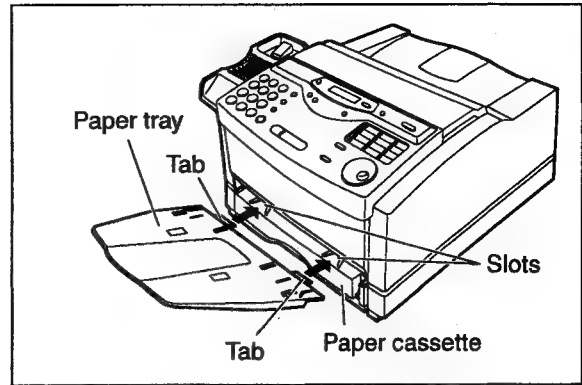


(2) Open the paper stacker.

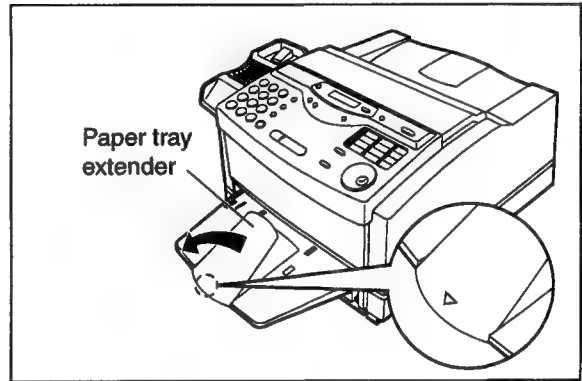


3. INSTALLING THE PAPER TRAY

- (1) Insert the two tabs of the paper tray into the slots on the paper cassette.



- (2) Open the paper tray extender by pressing "▽" marked area.

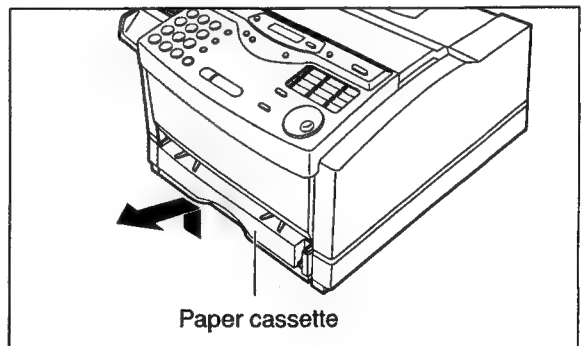


4. INSTALLING THE RECORDING PAPER

You can load letter or legal size paper in the paper cassette. The paper cassette can hold up to 250 sheets of 75 g/m² (20 lb.) paper. You can use 60 g/m² to 90 g/m² (16 lb. to 24 lb.) paper.

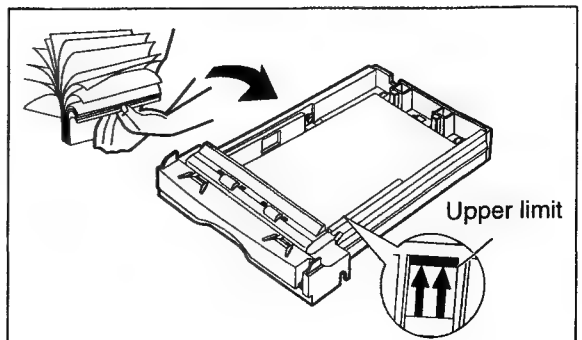
● Loading paper in the paper cassette

- (1) Lift the paper cassette up slightly and pull it out of the unit.

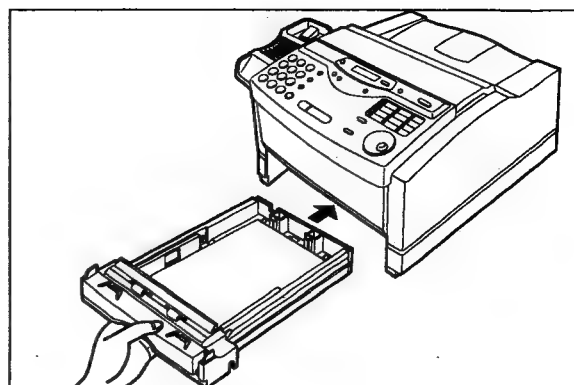


- (2) Fan the stack of paper to prevent a paper jam and place the paper into the paper cassette.

- Put the side to be printed face up.
- The height of the stack of paper should not exceed the upper limit on the paper cassette, or the paper may jam or multi-feed.



- (3) Insert the paper cassette into the unit until it clicks into place.

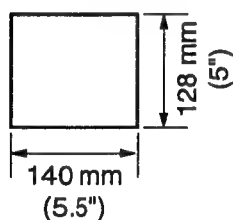


Note:

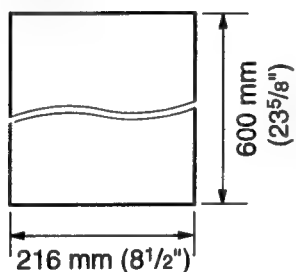
- Do not use different types or thicknesses of paper in the paper cassette at the same time. This may cause a paper jam.
- Avoid double-sided printing.
- Do not use paper printed from this unit for double-sided printing with other copiers or printers, or a paper jam may occur.

• Documents the unit can send

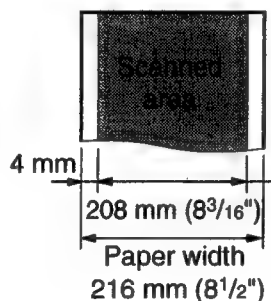
Minimum size



Maximum size



Effective scanning area



Document weight

Single sheet:
45 g/m² to 90 g/m²
(12 lb. to 24 lb.)

Multiple sheets:
60 g/m² to 75 g/m²
(16 lb. to 20 lb.)
(length 128mm~)

Note:

- Remove clips, staples or other similar fastening objects.
- Check that ink, paste or correction fluid has dried.
- Do not send the following types of document. Use copies for fax transmission.
 - Chemically treated paper such as carbon or carbonless duplicating paper
 - Electrostatically-charged paper
 - Heavily curled, creased or torn paper
 - Paper with a coated surface
 - Paper with a faint image
 - Paper with printing on the opposite side that can be seen through the front (e.g. newspaper)

5. SETTING YOUR LOGO

The logo can be your company, division or name.

- (1) Press **MENÜ**.

Display: Vorbereitung

- (2) Press **#**, then **0 2**.

Eigenes Logo

- (3) Press **START/ /KOPIE**.

LOGO=

- (4) Enter your logo, up to 30 characters, by using the dial keypad. See next page for details.**

Example: Bill

1. Press **(2)** twice.

LOGO=B

2. Press **4** six times.

Cursor

LOGO=B*i*

3. Press **5** six times.

LOGO=Bi1

4. Press **▶** to move the cursor to the next space and press **5** six times.

LOGO=Bill

- (5) Press **START/ /KOPIE**.

Parameter []

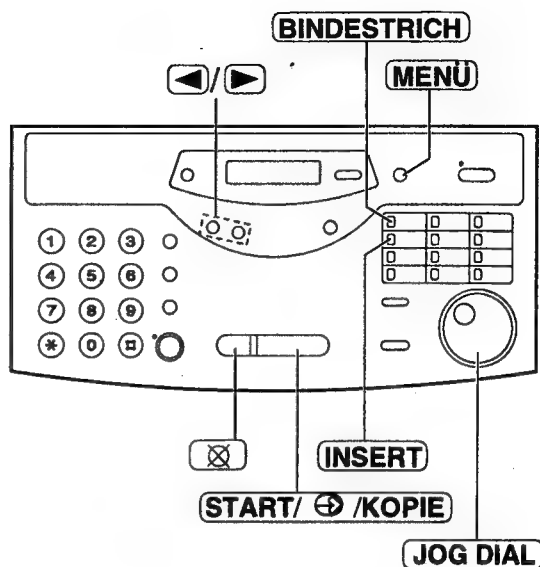
- (6) Press **MENÜ**.

To correct a mistake

- Use or to move the cursor to the incorrect character, then make the correction.

To delete a character



- Move the cursor to the character you want to delete and press 



Note:






- You can enter your logo by rotating **(JOG DIAL)** (see next page).

To insert a character

1. Use  or  to move the cursor to the right of where you want to insert the character.
2. Press **EINSCHALTEN** (One-Touch Dial key 2) to insert a space and enter the character.


• To select characters with the dial keypad

Pressing the dial keys will select a character as shown below.

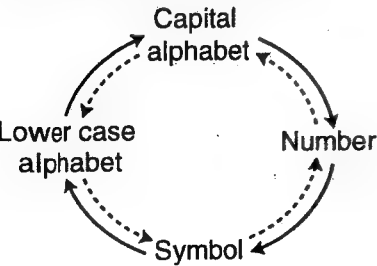
Keys	Characters
①	1 [] { } + - / = , . _ ` : ; ?
②	A Ä B C a ä b c 2
③	D E F d e f 3
④	G H I g h i 4
⑤	J K L j k l 5
⑥	M N O Ö m n o ö 6
⑦	P Q R S p q r s 7
⑧	T U Ü V t u ü v 8
⑨	W X Y Z w x y z 9
⑩	0 () < > ! " # \$ % & ¥ * @ ^ ' →
	HYPHEN key (To insert a hyphen.)
	INSERT key (To insert one character or one space.)
	Delete key (To delete a character.)
	◀ key (To move the cursor to the left.)
	▶ key (To move the cursor to the right.) To enter another character using the same number key, move the cursor to the next space.

• To select characters using the JOG DIAL

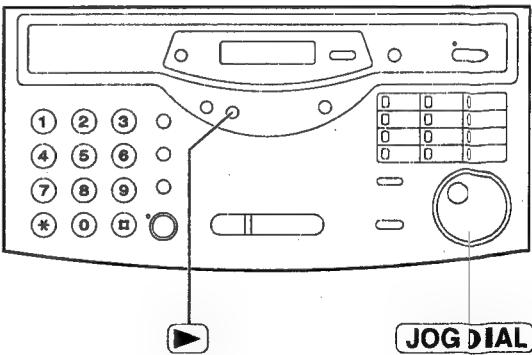
Instead of pressing the dial keys, you can select characters using the JOG DIAL.

- 1. Rotate **JOG DIAL** until the desired character is displayed.
- 2. Press  to move the cursor to the next space.
 - The character displayed in step 1 is inserted.
- 3. Return to step 1 to enter the next character.

Displayed order of characters



→ : Rotating to the right
---> : Rotating to the left



6. REPLACING THE TONER CARTRIDGE AND DRUM UNIT

When the display shows the following message, replace the toner cartridge and drum unit with new ones.

Display: TONER EMPTY OR TONER LOW
<Toner alle> <Toner schwach>

Depending on usage, the following message may be displayed.

DRUM LIFE OVER
OR
CHANGE DRUM
<Trommel Ende>

<Trommel wechsel>

The following is available for replacement.

KX-FA75X: Toner cartridge and drum unit

*Word in brackets < >are German.

Caution:

- If ingestion of toner occurs, drink several glasses of water to dilute stomach contents, and seek immediate medical treatment. If toner comes into contact with eyes, flush thoroughly with water, and seek medical treatment. If toner comes into contact with skin, wash thoroughly with soap and water.
- Do not put up the toner cartridge.
- The drum unit contains a photosensitive drum. Exposing it to light may damage the drum.
 - Do not expose the drum unit to light for more than 5 minutes.
 - Do not touch or scratch the green drum surface.
 - Do not place the drum unit near dust or dirt.
 - Do not place the drum unit in a high humidity area.
 - Do not expose the drum unit to direct sunlight.

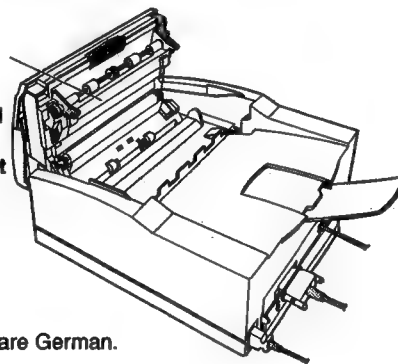
Important:

- To prevent loss of fax memory, when replacing the toner cartridge and drum unit, do not unplug the fax machine.
- Keep the protection materials in case the unit must be repacked and transported.

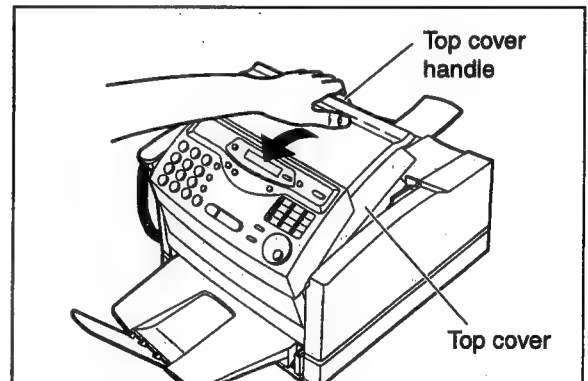
- (1) Pull the top cover handle forward and open the top cover.**



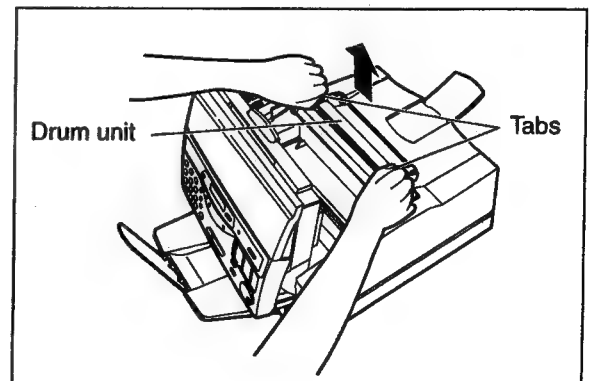
Caution:
The fuser unit gets
hot. Do not touch it.
<Warning:
Die Fixiereinheit wird
sehr heiß.
Berührung unbedingt
vermeiden.>



*Word in brackets < >are German.



- (2) Remove the used drum unit by holding the two tabs.**

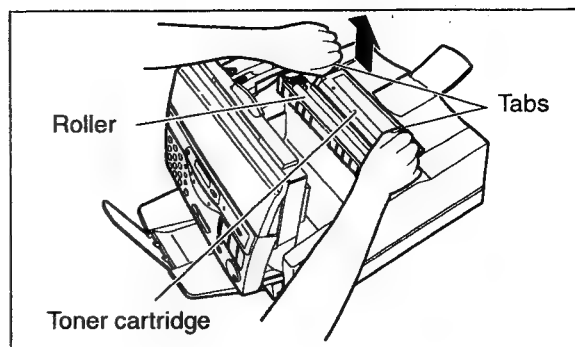


(continued)

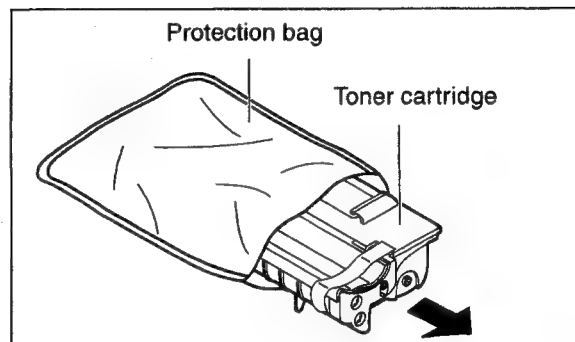
- (3) Remove the used toner cartridge by holding the two tabs.

Caution:

- To avoid getting your hands dirty, do not touch the roller.



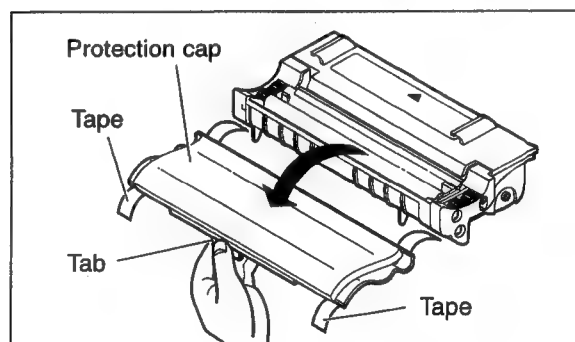
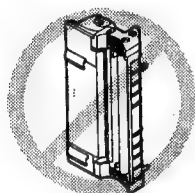
- (4) Open the protection bag by cutting the end of the bag and remove the new toner cartridge.



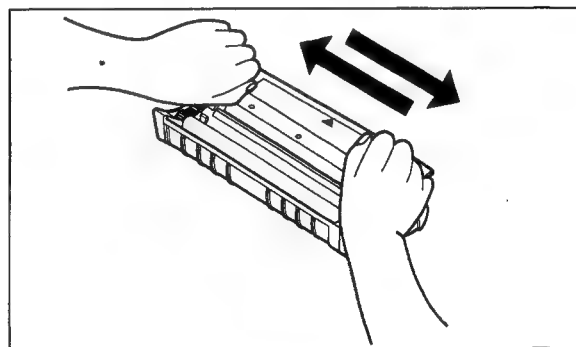
- (5) Remove the tape and remove the protection cap by holding the tab.

Caution:

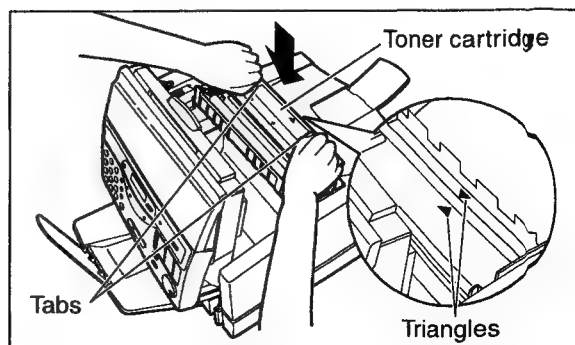
- Do not put up the toner cartridge.



- (6) Rock the toner cartridge from side to side several times carefully.

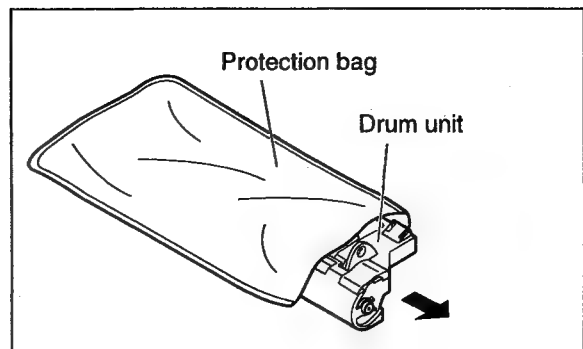


- (7) Install the new toner cartridge by holding the two tabs and matching the triangles.

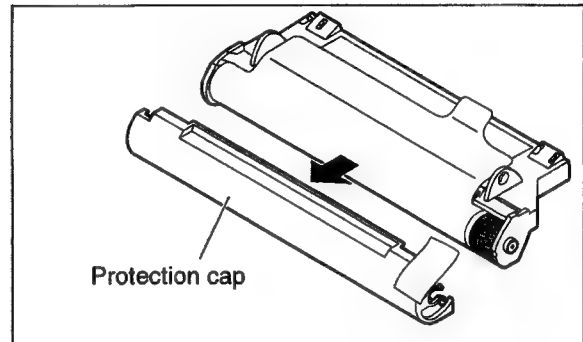


KX-FLM600G

- (8) Open the protection bag by cutting the end of the bag and remove the drum unit.



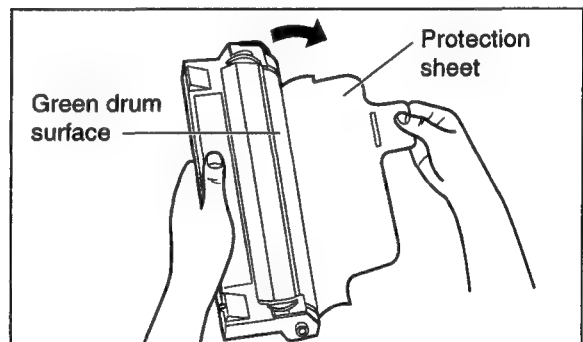
- (9) Remove the protection cap.



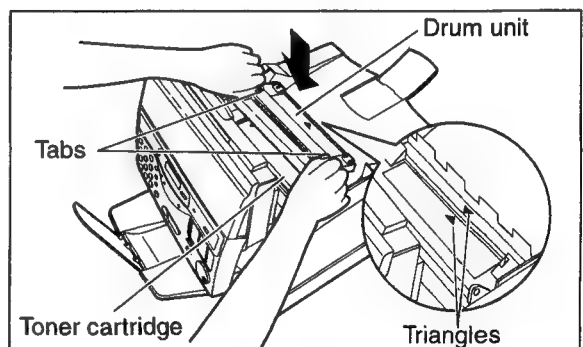
- (10) Remove the protection sheet.

Caution:

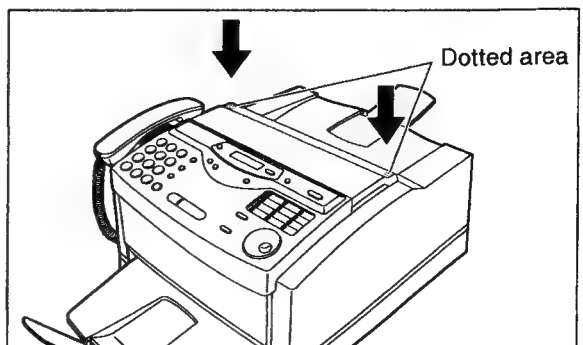
- Do not touch or scratch the green drum surface as this may damage the drum unit.
- Do not expose the drum unit to light for more than 5 minutes as this may damage the drum unit.



- (11) Install the new drum unit on the toner cartridge by holding the two tabs and matching the triangles.



- (12) Close the top cover securely by pushing down on the dotted area at both ends.



MAINTENANCE ITEMS AND COMPONENT LOCATIONS

1. OUTLINE

MAINTENANCE AND REPAIRS ARE PERFORMED USING THE FOLLOWING STEPS.

1) Periodic maintenance

Inspect the equipment periodically and if necessary, clean any contaminated parts.

2) Check for breakdowns

Look for problems and consider how they arose.

If the equipment can be still used, perform copying, self testing or communication testing.

3) Check equipment

Perform copying, self testing and communication testing to determine if the problem originates from the transmitter, receiver or the telephone line.

4) Determine causes

Determine the causes of the equipment problem by troubleshooting.

5) Equipment repairs

Repair or replace the defective parts and take appropriate measures at this stage to ensure that the problem will not recur.

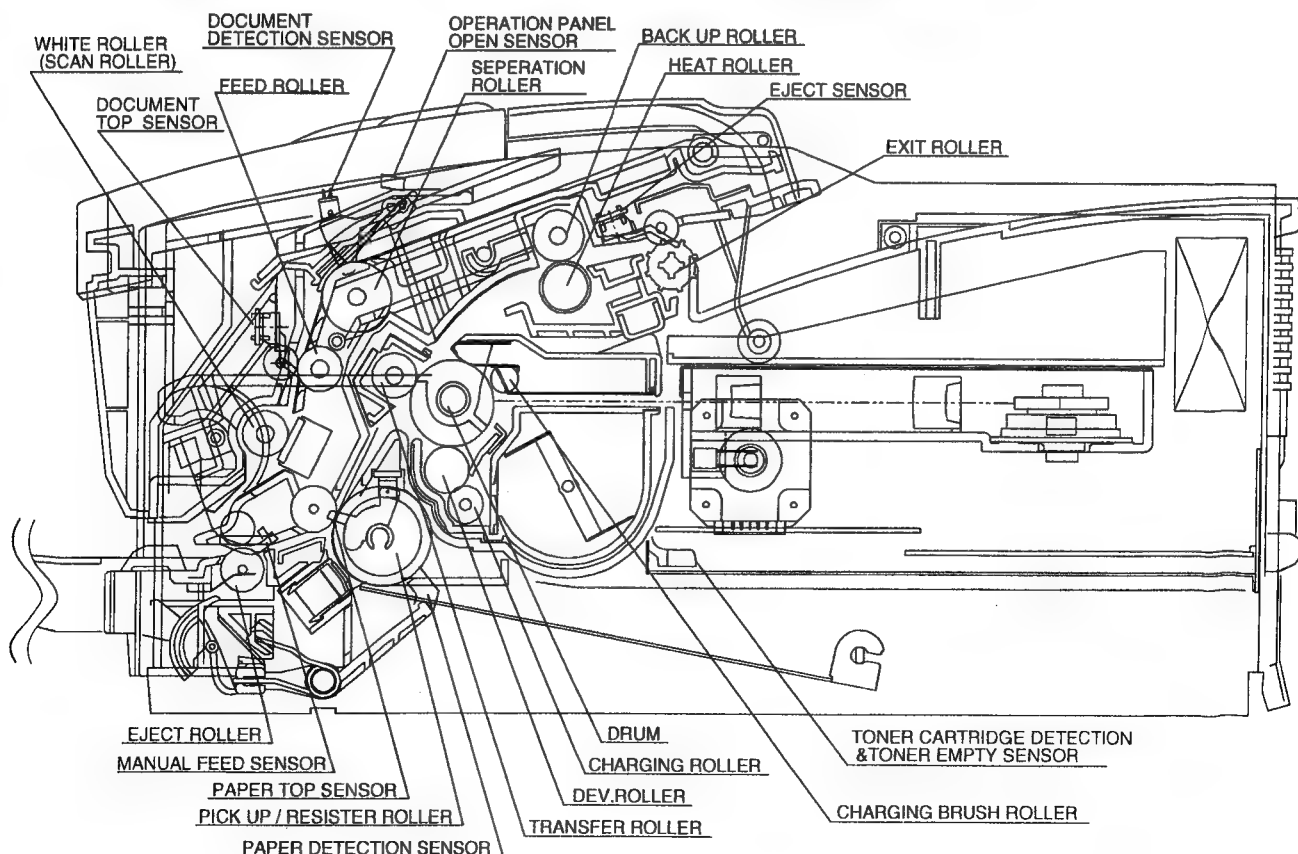
6) Confirm normal operation of the equipment

After completing the repairs, conduct copying, self testing and communication testing to confirm that the equipment operates normally.

7) Record keeping

Make a record of the measures taken to rectify the problem for future reference.

2. MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS



2.1 MAINTENANCE LIST

NO.	OPERATION	CHECK
1	Document Path	Remove any foreign matter such as paper.
2	Rollers	If the roller is dirty, clean it with a damp cloth then dry thoroughly.
3	Platen Roller	If the platen is dirty, clean it with a damp cloth then dry thoroughly. Remove the paper and film cartridge before cleaning.
4	Target Glass, White Plate	If the target glass and white plate are dirty, clean the glass with a soft dry cloth.
5	Sensors	Paper sensor (P_SEN), R.P. sensor (RP_SW), Resister sensor (R_SEN), Scan cover open sensor (C_C-SW), Manual sensor (M_SW), Exit Sensor (E_SW).
6	Mirrors and Lens	If the mirrors and lens are dirty, clean them with a soft dry cloth.
7	Abnormal, wear and tear or loose parts	Replace the part. Check if the screws are tight on all parts.

2.2 MAINTENANCE CYCLE

No.	Item	Cleaning	Replacement	
		Cycle	Cycle	Procedure
1	White (Scan) Roller (Ref. No.340)	3 months	7 years (100,000 documents)	Refer to DISASSEMBLY INSTRUCTIONS.(page 158)
2	Separation Roller (Ref. No.307)	3 months	7 years (100,000 documents)	Refer to DISASSEMBLY INSTRUCTIONS.(page 157)
3	Feed Roller (Ref. No.306)	3 months	7 years (100,000 documents)	Refer to DISASSEMBLY INSTRUCTIONS.(page 157)
4	Pick up / Resisit Roller (Ref. No.618)	3 months	7 years (100,000 documents)	Refer to DISASSEMBLY INSTRUCTIONS.(page 153)
5	Separation Pad (Ref. No.121)	3 months	7 years (100,000 documents)	(page 271)
6	Separation Pad (Ref. No.515)	3 months	7 years (100,000 documents)	(page 275)

↓

These values are only standard ones and may vary depending on usage conditions.

3. MAINTENANCE

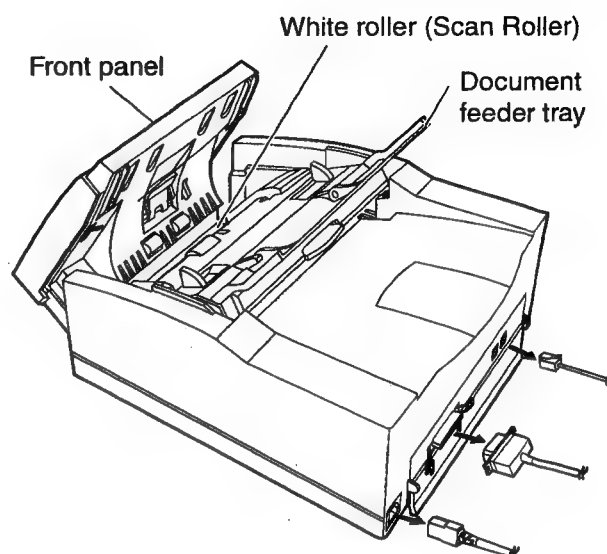
CLEANING

If white or black bands appear on a copied or transmitted document, clean the white roller.

- (1) Disconnect the printer cable, the power cord and the telephone line cord.
- (2) Open the document feeder tray and the front panel.
- (3) Clean the white roller with a cloth moistened with isopropyl rubbing alcohol by rotating the roller and let it dry thoroughly.
- (4) Close the front panel securely by pushing down on both ends.
- (5) Connect the printer cable, the power cord and the telephone line cord.

Caution:

- Do not use paper products, such as paper towels or tissues, to clean the white roller.



TROUBLESHOOTING GUIDE

1. Troubleshooting Summary	29
1.1 Troubleshooting	29
1.2 Precautions	29
1.3 When you don't know how to operate the unit, use the Help function	29
2. User Recoverable Errors	30~33
3. Troubleshooting Details	34~107
3.1 Outline	34
3.2 Trouble shooting Items Table	34
3.3 Simple Check List	35
3.4 Simplified Troubleshooting List	36, 37
3.5 Q&A	38
3.6 Print (1)~(9)	39~47
3.7 Recording Paper Feed (1)~(6)	48~52
3.8 ADF section (1)~(9)	53~58
3.9 Communication section	59~81
3.10 Electrical section	82~107
4. PANALINK	108~116
5. Programming and Lists	117~129
5.1 Operation	117
5.2 Operation Flow	118~120
5.3 User Mode	121
5.4 Service Mode Setting	122~125
5.5 Special Service Journal Reports	126~129
6. Test Functions	130~134
6.1 DTMF Signal Tone Transmit Selection	131
6.2 Button Code Table	131
6.3 Print Test Pattern	132~134

1. TROUBLESHOOTING SUMMARY

1. 1 TROUBLESHOOTING

After confirming the problem by asking the user, troubleshoot according to the instructions and observe the following precautions.

1. 2 PRECAUTIONS

- 1) If there is a problem with the print quality or the paper feed, first check if the installation space and the print paper meets the specifications, the paper cassette is set correctly, and the paper is set correctly without any slack.
- 2) Before troubleshooting, first check that the connectors and cables are connected correctly (not loose). If the problem occurs randomly, check it very carefully.
- 3) When connecting the AC power cord with the unit and checking the operation, exercise utmost care when handling electric parts in order to avoid electric shocks and short-circuits.
- 4) After troubleshooting, double check that you have not forgotten any connectors, left any loose screws, etc.
- 5) Always test to verify that the unit is working normally.

1. 3 WHEN YOU DON'T KNOW HOW TO OPERATE THE UNIT, USE THE *HELP* FUNCTION

- How to use: 1. Press **HELP** (**HILFE**).
- 2. Press **▲** or **▼** until the desired item is displayed.
- 3. Press **START/SET/COPY** (**START/☞/KOPIE**)

*Words in brackets () are German.

2. USER RECOVERABLE ERRORS

If the unit detects a problem, one or more of the following messages will appear on the display.

DISPLAY MESSAGE	CAUSE AND REMEDY
<div>CALL SERVICE LP (Service notw.LP)</div> <div>CALL SERVICE LB (Service notw.LB)</div> <div>CALL SERVICE FU (Service notw.FS)</div>	<p>There is something wrong with the unit. Contact our service personnel.</p> <ul style="list-style-type: none"> • Polybon motor error. Replace LSU unit. • Laser beam error. Replace LSU unit or HVPS. • Fuser unit can not heat up. Replace fuser unit.
<div>CHANGE DRUM Trommel wechseln</div>	<ul style="list-style-type: none"> • The drum unit is being worn out. Replace the drum unit and toner cartridge with new ones as soon as possible.
<div>CHECK DOCUMENT (Vorlage prüfen)</div>	<ul style="list-style-type: none"> • The document is not fed into the unit properly. Reinsert the document.
<div>CHECK DRUM (Prüfen Tonermmel)</div>	<ul style="list-style-type: none"> • The drum unit is not inserted properly. Reinsert it correctly. • The installed drum is worn out. Replace the drum unit with a new one.
<div>CHECK MEMORY (Speicher prüfen)</div>	<ul style="list-style-type: none"> • Memory (telephone numbers, parameters, etc.) has been erased. Re-program. [The backup battery on the top of the digital board may be low or dead, so check it.]
<div>CHECK TONER (Prüfe Toner)</div>	<ul style="list-style-type: none"> • The toner cartridge is not installed properly. Reinsert it correctly.
<div>DRUM LIFE OVER (Trommel Ende)</div>	<ul style="list-style-type: none"> • The drum unit has reached the end of its life expectancy. Replace the drum unit and toner cartridge with new ones.
<div>FAILED PICK UP (Fehleinzug)</div>	<ul style="list-style-type: none"> • The unit cannot pick up the recording paper loaded in the paper cassette. Remove the paper cassette and clear the jammed paper. (see page 33)
<div>FAX IN MEMORY (Fax im Speicher)</div>	<ul style="list-style-type: none"> • The unit has a document in memory. See the other message instructions to print out the document.
<div>FAX MEMORY FULL (Speicher voll)</div>	<ul style="list-style-type: none"> • Memory is full of received documents due to a lack of recording paper or a recording paper jam etc. Install paper or clear the jammed paper. • When performing memory transmission, the document being stored exceeds the memory capacity of the unit. Transmit the entire documents using manual or automatic transmission.
<div>EASY DIAL FULL (JOG-DIAL voll)</div>	<ul style="list-style-type: none"> • There is no space to store new stations in the JOG DIAL directory. Edit or erase unnecessary stations.
<div>MEMORY FULL (Speicher voll)</div>	<ul style="list-style-type: none"> • When making a copy, the document being stored exceeds the memory capacity of the unit. Press (STOP) to clear the message. Divide the documents and try again.
<div>MODEM ERROR (Modemfehler)</div>	<ul style="list-style-type: none"> • There is something wrong with the modem circuit. Contact our service personnel.
<div>NO FAX REPLY (Keine Faxantw)</div>	<ul style="list-style-type: none"> • The other party's fax machine is busy or has run out of recording paper. Try again.
<div>OUT OF PAPER (Papier alle)</div>	<ul style="list-style-type: none"> • The recording paper is not installed or the unit has run out of paper. Install paper.
<div>PANEL OPEN (Bedienf.offen)</div>	<ul style="list-style-type: none"> • The front panel is open. Close it.
<div>PAPER JAMED (Papierstau)</div>	<ul style="list-style-type: none"> • A recording paper jam occurred. Clear the jammed paper. [If the printout jams, please refer to Fig. a. on the 32 page.]

DISPLAY MESSAGE	CAUSE AND REMEDY
PC FALL OR BUSY (PC Verbind.Fehl)	<ul style="list-style-type: none"> The fax function cannot be operated by the PC. The printer cable is not connected correctly, or the software is not running on the PC.
PLEASE WAIT (Bitte warten)	<ul style="list-style-type: none"> The top cover was closed. Wait a while. (START/SET/COPY) was pressed during the power save mode. Wait a while.
REDIAL TIME OUT (WW Zeitablauf)	<ul style="list-style-type: none"> The other party's fax machine is busy or has run out of recording paper. Try again.
REMOVE DOCUMENT (Stau beseitigen)	<ul style="list-style-type: none"> The document is jammed. Remove the jammed document. Attempted to transmit a document longer than 600 mm (23⁵/₈). Press the (STOP) button to remove the document. Divide the document into two or more sheets and try again. [Alternately, turn off service code #559 to enable sending of documents longer than 600 mm.]
REMOVE PAPER (Papier entfen.)	<ul style="list-style-type: none"> Paper was placed on the paper tray for manual feeding without first pressing (START/SET/COPY). Remove the paper. When the "Bitte warten" message disappears, place the paper on the paper tray. The paper cassette is not inserted correctly. Insert it correctly.
TONER EMPTY (Toner alle)	<ul style="list-style-type: none"> The toner is empty. Replace the toner cartridge and drum unit with new ones.
TONER LOW (Toner schwach)	<ul style="list-style-type: none"> The remaining toner is low. Replace the toner cartridge and drum unit with new ones as soon as possible.
TOP COVER OPEN (Deckel offen)	<ul style="list-style-type: none"> The top cover is open. Close it.
TRANSMIT ERROR (Ubeltrr.Fehler)	<ul style="list-style-type: none"> Transmission error occurred. Try again.
UNIT OVERHEATED (Thermokopf heiß)	<ul style="list-style-type: none"> The unit is too hot. Let the unit cool down.
USE 1 FEED ONLY (Nur 1Blatt einf)	<ul style="list-style-type: none"> When making transmission or copying, another sheet was placed on the paper tray. Remove it from the paper tray and try again.
WRONG PAPER (Paper falsch)	<ul style="list-style-type: none"> The unit printed on paper which is shorter than letter size paper. To prevent the drum unit becoming dirty, use letter or legal size paper and set the correct recording paper size in feature setting #16. (see page 36)
KX-FLM600G ONLY (Empf.Fehler)	<ul style="list-style-type: none"> Receiving error occurred.

*The explanations given in the [] are for servicemen only.

*Words in brackets () are German.

KX-FLM600G

Remove the jammed paper as follows.

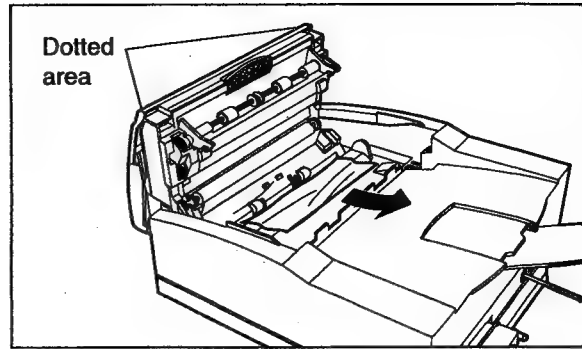
• If paper has jammed on the drum unit

- (1) Remove the jammed paper carefully.

Caution:

- Do not touch or scratch the green drum surface as this may damage the drum unit.

- (2) Close the top cover securely by pushing down on the dotted area at both ends.



• If paper has jammed in the fuser unit

- (1) Pull the jammed paper out carefully.

Caution:

- Do not touch or scratch the green drum surface as this may damage the drum unit.

- (2) Close the top cover securely by pushing down on the dotted area at both ends.

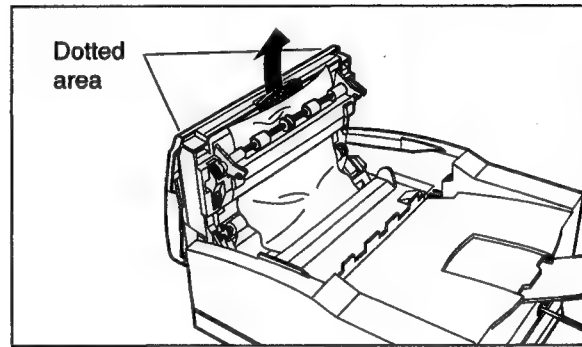


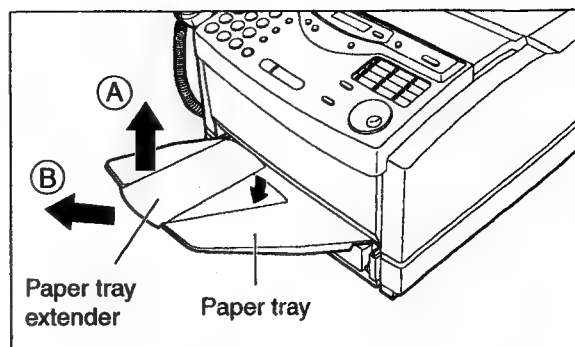
Fig. a

Note:

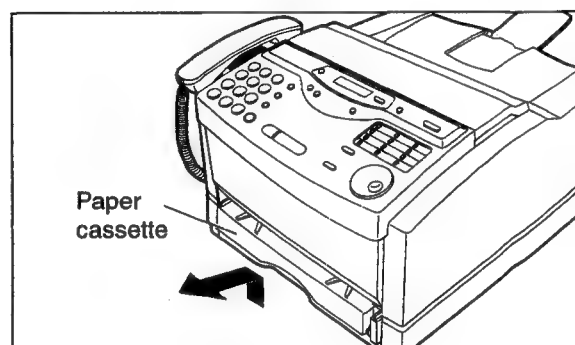
- If the jammed paper cannot be found, it may have stopped under the drum unit.

• If "FAILED PICK UP" is displayed

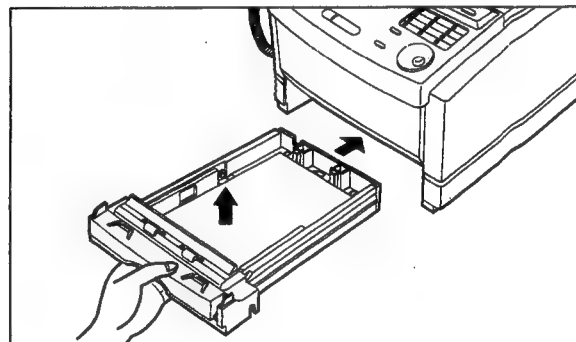
- (1) Close the paper tray extender and remove the paper tray by (A) slightly lifting and (B) pulling it out of the unit.



- (2) Lift the paper cassette up slightly and pull it out of the unit.



- (3) Remove the jammed recording paper.
- (4) Insert the paper cassette into the unit until it clicks into place.
- (5) Replace the paper tray and open the paper tray extender.



3. TROUBLESHOOTING DETAILS

3.1 OUTLINE

Troubleshooting is for recovering quality and reliability by determining the broken component and replacing, adjusting or cleaning it as required. First, determine the problem then decide the troubleshooting method. If you have difficulty finding the broken part, determine which board is broken. (For example: the Digital PCB, Analog PCB, etc.) The claim tag from a customer or dealer may use different expressions for the same problem, as they are not a technician or engineer. Using your experience, test the problem area corresponding to the claim. Also, returns from a customer or dealer often have a claim tag. For these cases as well, you need to determine the problem. Test the unit using the simple check list on page 35. Difficult problems may be hard to determine, so repeated testing is necessary.

3.2 TROUBLESHOOTING ITEMS TABLE

ITEM	SYMPTOM	SEE THIS PAGE.
ADF (Auto Document Feeder)	The document does not feed.	53
	Document jam	54
	Multiple feed	55
	Skew	56
Recording paper feed	The recording paper does not feed.	50
	Paper jam	51
	Multiple feed and skew	48, 49
Printing	The sent fax data is skewed.	57
	The received fax data is skewed.	57
	The received or copied data is expanded.	46
	Blank print.	47
	Blank ,white point.	40
	Dark vertical line	39
	Ghost Image lateral line	58
	An abnormal image is copied.	
Communication FAX, TEL (analog board)	Cannot communicate by fax.	59
	An error code is displayed.	59
	Cannot talk.	92
	The DTMF tone doesn't work.	92
	The handset/monitor doesn't work, etc.	92
Operation panel	Keys are not accepted.	96
Sensor	If the electric circuit is the cause, the error message corresponding to the sensor will be displayed.	97

3.3 SIMPLE CHECK LIST

SERIAL NO.		DATE	
FUNCTION		JUDGEMENT	REFERENCE
FAX operation	Transmission	OK / NG	
	Receiving	OK / NG	
Copy operation		OK / NG	
PC operation	PANA LINK Transmission	OK / NG	
	PANA LINK Receiving	OK / NG	
	PANA LINK scan	OK / NG	
	PC Print	OK / NG	
Telephone operation	Handset transceiver/ receiver	OK / NG	
	SP-PHONE sound	OK / NG	
	Ringer sound	OK / NG	
	Dial operation	OK / NG	
	Volume operation	OK / NG	
	VOX detection	OK / NG	Service code 815*
Operation panel	Key check	OK / NG	Service code 561*
	LED check	OK / NG	Service code 557*
	LCD check	OK / NG	Service code 558*
Sensor	Sensor check	OK / NG	Service code 815*
Clock	Sensor check	OK / NG	Is the time kept correctly? Check with another clock.
EXT-TAM	Handset transceiver/receiver	OK / NG	
	Remote control	OK / NG	

* Check according to the service code referring to the Test function on pages 130 and 131.

3.4 SIMPLIFIED TROUBLESHOOTING LIST

[] means Ref.No.

	Symptom	Possible Cause	Remedy
1	Can not print. (Nothing is printed.)	The laser does not light.	Replace the laser unit. [13]
		The data is not received.	Check the board. [PCB7]
2	Can not print. (The whole page is black with the frame.)	The laser keeps lighting.	Replace the laser unit or check the board. [PCB5]
3	Can not print. (The whole page is black without the frame.)	The unit is not charged with electricity.	Replace the OPC unit or check the high voltage board.
4	White vertical lines	Some dusts are attached on the laser unit.	Clean the glass of the laser unit. [13]
		Some dusts are attached on DEV roller.	Replace the DEV unit. [A8]
		The shading data is not correct.	Take the shading data again.
5	Black vertical lines	Some dusts are attached on DEV roller.	Replace the DEV unit. [A8]
		OPC drum is dirty with the toner.	Clean the OPC drum. [A7]
		The shading data is not correct.	Take the shading data again.
		CIS is dirty.	Clean the glass of CIS. [361]
6	White horizontal lines	The gear is dirty or broken.	Replace the gear. [A8]
		The torque of DEV unit is heavy.	Replace the DEV unit. [A8]
7	Black horizontal lines	OPC drum is scratched.	Replace the OPC unit. [A7]
8	White dots	The scratch of OPC (94mm pitch)	Replace the OPC unit. [A7]
		The scratch of DEV roller (22mm pitch)	Replace the DEV unit. [A8]
9	Black dots	The scratch of OPC (94mm pitch)	Replace the OPC unit. [A7]
		OPC is dirty. (94mm pitch)	Clean the OPC unit. [A7]
		The scratch of DEV roller (22mm pitch)	Replace the DEV unit. [A8]
10	The recording paper is dirty. (both sides of the recording paper)	The toner is leaked from the side of DEV roller.	Replace the DEV unit. [A8]
11	The recording paper is dirty. (the front and rear of the recording paper)	The paper path is dirty.	Clean the paper path.
		The setting of recording paper at KX-FLM600 is incorrect.	Set the paper size according to the paper in the cassette.
12	The recording paper is dirty. (the whole page)	The toner is leaked.	Replace the OPC unit. [A7]
13	The recording paper is dirty. (back side)	The transcription roller is dirty.	Clean the transcription roller. [234]
		The setting of recording paper at KX-FLM600 is incorrect.	Set the paper size according to the paper in the cassette.
14	The ghost appears on the paper.	The transcription voltage is low.	Replace the high voltage board. [PCB5]
		The recording paper is too thick.	Use the paper between 16lb and 24lb.
15	The printed letters on the envelope is dirty	The envelope that contains cotton is used.	Change the kind of envelope.
		PC is not set to envelop mode.	Set PC to envelop.
16	The printed letters on the OHP is dirty.	The transcription voltage is low or too high.	Replace the high voltage board. [PCB5]
		The recommended OHP sheet is not used.	Use CG3300 or CG5000.
17	The printed letters in black are not clear.	The toner in DEV unit is a little.	Replace the DEV unit. [A8]
		The laser unit is dirty.	Clean the glass of the laser unit. [13]
18	The printed letters are uneven.	The toner in DEV unit is a little.	Replace the DEV unit. [A8]
		The laser unit is dirty.	Clean the glass of the laser unit. [13]
19	The printing paper is jammed.	The heat roller does not separate smoothly.	Clean or replace the heat roller. [219]
		The sensor does not work.	Replace the sensor or check the board. [PCB8]
		The recording paper is set to the paper tray.	Take out the papers from the paper tray.
		The recording paper is too thin.	Use the paper between 16lb and 24lb.
20	The printing paper is jammed. (The paper does not come out from the cassette.)	Too many recording papers are inserted in the tray.	Reduce the paper to the limit label in the tray.
		The recording paper is too thick.	Use the paper between 16lb and 24lb.
		The rear-end guide of cassette does not fit to the recording paper.	Fit the rear-end guide of cassette to the recording paper.

[] means Ref.No.

	Symptom	Possible Cause	Remedy
21	Some printing papers are fed simultaneously.	The separator of recording paper is dirty.	Clean the printing paper separator. [516]
22	The printing paper is skewed.	Too many recording papers are inserted in the tray.	Reduce the paper to the limit label in the tray.
		The recording paper is too thick.	Use the paper between 16lb and 24lb.
23	The printing paper is waved	The heat roller does not separate smoothly.	Clean or replace the heat roller. [219]
24	The printing paper is wrinkled.	The recording paper is too thin.	Use the paper between 16lb and 24lb.
25	The document is jammed.	The sensor does not work.	Replace the sensor or check the board.
26	Some documents are fed	The separator of the document is dirty.	Clean the document separator. [121]
27	The document is skewed.	The document slider is not set to the document properly.	Set the document slider to the document properly.
28	Can not copy. (The whole page is white.) (PC printing is OK.)	CIS is broken.	Replace the CIS. [361]
		AK8414 of printer controller board is broken	Replace AK8414. [U9]
29	Can not copy. (The whole page is	CIS is broken.	Replace the CIS. [361]
30	Can not copy. (The image is distorted.) (PC printing is OK.)	CIS is broken.	Replace the CIS. [361]
31	Can not feed the paper manually.	The unit is in the sleep mode.	Press the START button before manual feeding. Then insert the paper to the manual feeder after the warming-up.
32	Can not feed the paper manually. (After warming-up)	The manual feed sensor does not work.	Replace the sensor or check the board.
33	Can not feed the paper manually. (Paper jam)	The recording paper is not set properly.	Match the recording paper to the mark of tray.
		The recording paper is too thick.	Use the paper between 16lb and 28lb.
		The papers are not made neat.	Make the recording papers neat, then set them into the cassette.
34	The paper is skewed when feeding manually.	The recording paper is set skewed.	Set the paper straight.
		The recording paper is too thick.	Use the paper between 16lb and 28lb.
35	The legal printing can not be done.	FLM600 is not set to the Legal.	Set KX-FLM600 to the Legal.
36	The copy is light (whitish).	CIS is broken.	Replace the CIS. [361]
		Shading data is destroyed.	Do the shading again.
37	The document is not drawn in.	The document detection sensor does not work.	Replace the sensor or check the board.
38	CHECK DRUM appears.	The OPC unit is out of conduction.	Replace the OPC unit. [A7]
		The contact with the terminal of main body is bad.	Check the deformation of the terminal of main body, then repair it.
39	CHECK TONER appears.	The toner is inclined to one side.	Shake the toner cartridge. Initialize two or three times.
		The gears of DEV unit are assembled improperly.	Replace the DEV unit. [A8]
		The sensor does not work.	Replace the sensor. [PC1 on PCB6]
40	PAPER JAM is displayed.	The resist sensor is broken.	Replace the sensor. [PCB8]
		The paper-discharging sensor is broken.	Replace the sensor. [PCB10]
41	OUT OF PAPER is displayed.	The paper sensor is broken.	Replace the sensor. [PCB9]
42	COVER OPEN is displayed.	The interlock SW is broken.	Replace the sensor. [PCB5]
43	TONER LOW is displayed.	The gears in the DEV unit are assembled improperly.	Replace the DEV unit.
44	CHECK DOCUMENT is displayed.	The document sensor is broken.	Replace the sensor. [PI301 on PCB3]

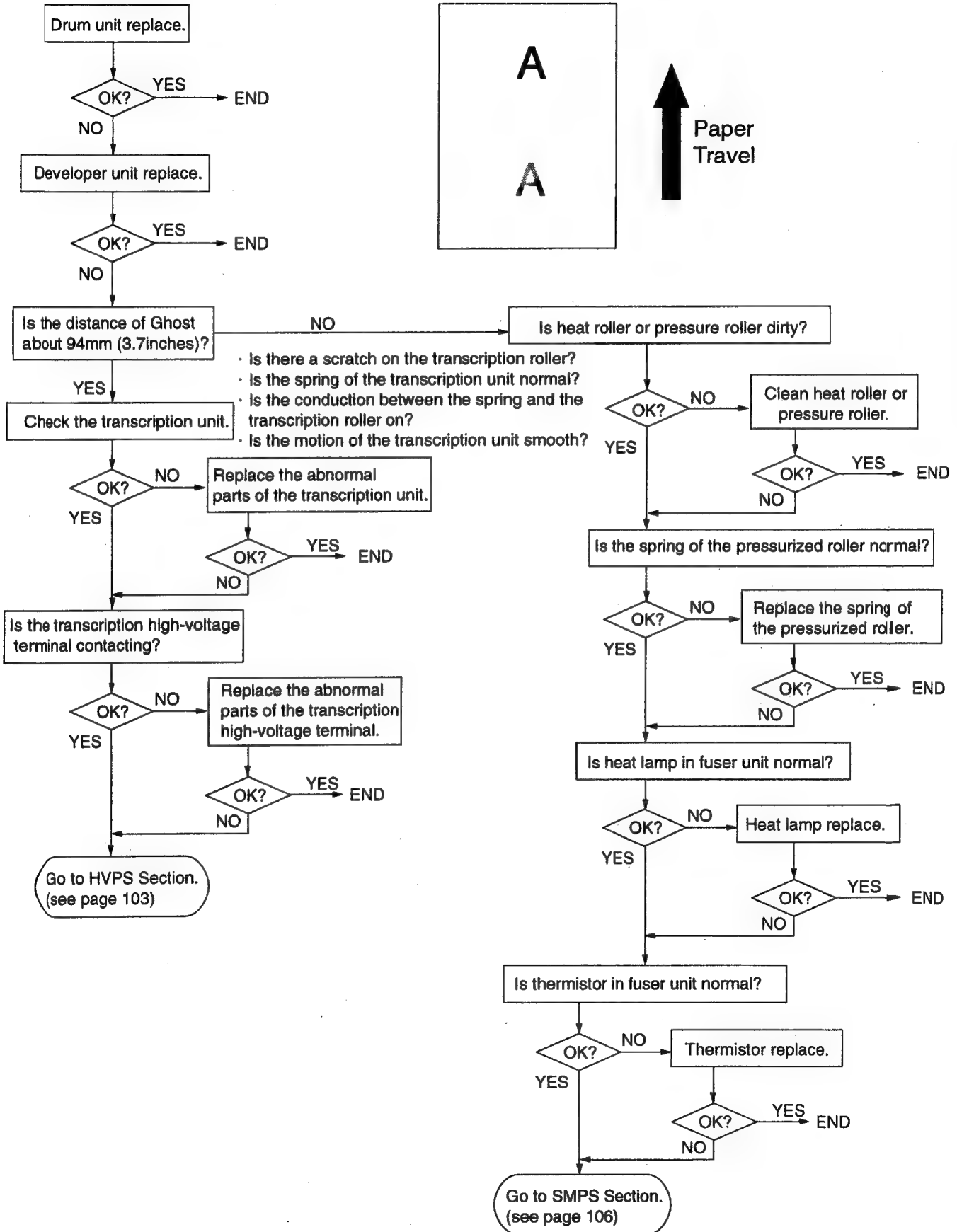
3.5 Q & A

[] means Ref.No.

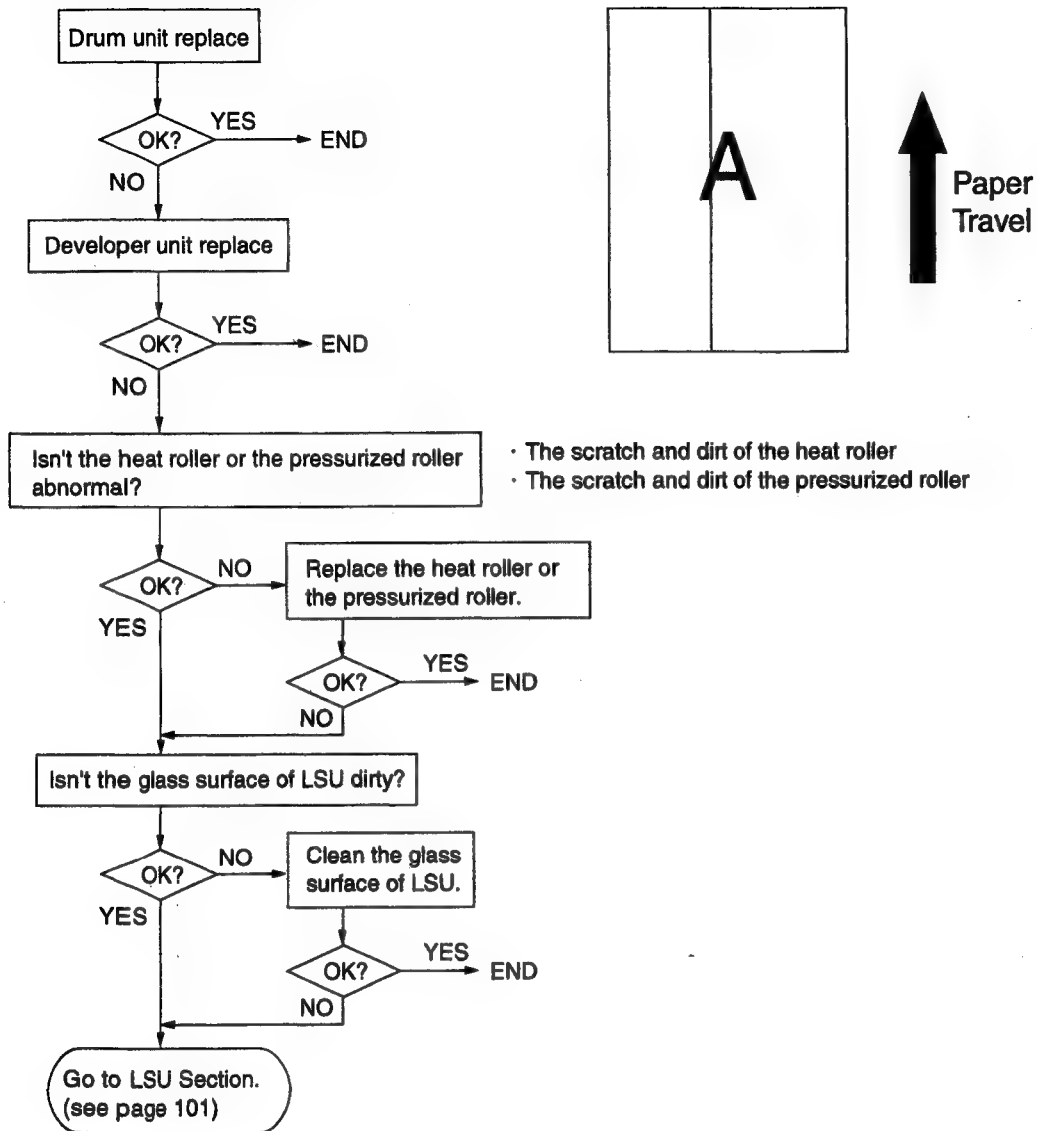
	Symptom	Possible Cause	Remedy
1	White vertical lines	Some dusts are attached on DEV	Replace the DEV unit. [A8]
2	Black vertical lines	Some dusts are attached on DEV	Replace the DEV unit. [A8]
		The shading data is not correct.	Take the shading data again.
3	White horizontal lines	The torque of DEV unit is heavy.	Replace the DEV unit. [A8]
4	Black horizontal lines	OPC drum is scratched.	Replace the OPC unit. [A7]
5	White dots	The scratch of OPC (94mm pitch)	Replace the OPC unit. [A7]
		The scratch of DEV roller (22mm pitch)	Replace the DEV unit. [A8]
6	Black dots	The scratch of OPC (94mm pitch)	Replace the OPC unit. [A7]
		OPC is dirty. (94mm pitch)	Clean the OPC unit. [A7]
		The scratch of DEV roller (22mm pitch)	Replace the DEV unit. [A8]
7	The recording paper is dirty. (both sides of the recording paper)	The toner is leaked from the side of DEV roller.	Replace the DEV unit. [A8]
8	The recording paper is dirty. (the front and rear of the recording paper)	The setting of recording paper at KX-FLM600 is incorrect.	Set the paper size according to the paper in the cassette.
9	The recording paper is dirty. (the whole page)	The toner is leaked.	Replace the OPC unit. [A7]
10	The recording paper is dirty. (back side)	The setting of recording paper at KX-FLM600 is incorrect.	Set the paper size according to the paper in the cassette.
11	The ghost appears on the paper.	The recording paper is too thick.	Use the paper between 16lb and 24lb.
12	The printed letters on the envelope is dirty.	The envelope that contains cotton is used.	Change the kind of envelope.
		PC is not set to envelop mode.	Set PC to envelop.
13	The printed letters on the OHP is dirty.	The recommended OHP sheet is not used.	Use CG3300 or CG5000.
14	CHECK TONER appears.	The toner in DEV unit is a little.	Replace the DEV unit. [A8]
15	The printed letters are uneven.	The toner in DEV unit is a little.	Replace the DEV unit. [A8]
16	The printing paper is jammed.	The recording paper is set to the manual feeder.	Take out the papers from manual feeder.
		The recording paper is too thin.	Use the paper between 16lb and 24lb.
17	The printing paper is jammed. (The paper does not come out from the cassette.)	Too many recording papers are inserted in the tray.	Reduce the paper to the limit label in the tray.
		The recording paper is too thick.	Use the paper between 16lb and 24lb.
		The rear-end guide of cassette does not fit to the recording paper.	Fit the rear-end guide of cassette to the recording paper.
18	Some printing papers are fed simultaneously.	The separator of recording paper is dirty.	Clean the printing paper separator. [516]
19	The printing paper is skewed.	Too many recording papers are inserted in the tray.	Reduce the paper to the limit label in the tray.
		The recording paper is too thick.	Use the paper between 16lb and 24lb.
20	The printing paper is wrinkled.	The recording paper is too thin.	Use the paper between 16lb and 24lb.
21	Some documents are fed	The separator of the document is dirty.	Clean the document separator. [121]
22	The document is skewed.	The document slider is not set to the document properly.	Set the document slider to the document properly. [121]
23	Can not feed the paper manually.	The unit is in the sleep mode.	Press the START button before manual feeding. Then insert the paper to the manual feeder after the warming-up.
24	Can not feed the paper manually. (Paper jam)	The recording paper is not set properly.	Match the recording paper to the mark of tray.
		The recording paper is too thick.	Use the paper between 16lb and 28lb.
		The papers are not made neat.	Make the recording papers neat, then set them into the cassette.
25	The paper is skewed when feeding manually.	The recording paper is set skewed.	Set the paper straight.
		The recording paper is too thick.	Use the paper between 16lb and 28lb.
26	The legal printing can not be done.	KX-FLM600 is not set to the Legal.	Set KX-FLM600 to the Legal.
27	CHECK TONER appears.	The toner is inclined to one side.	Shake the toner cartridge. Initialize two or three times.

3.6 PRINT

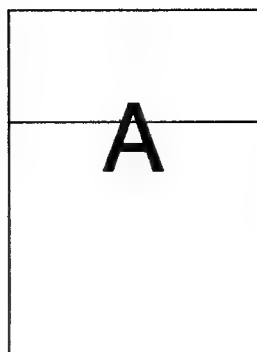
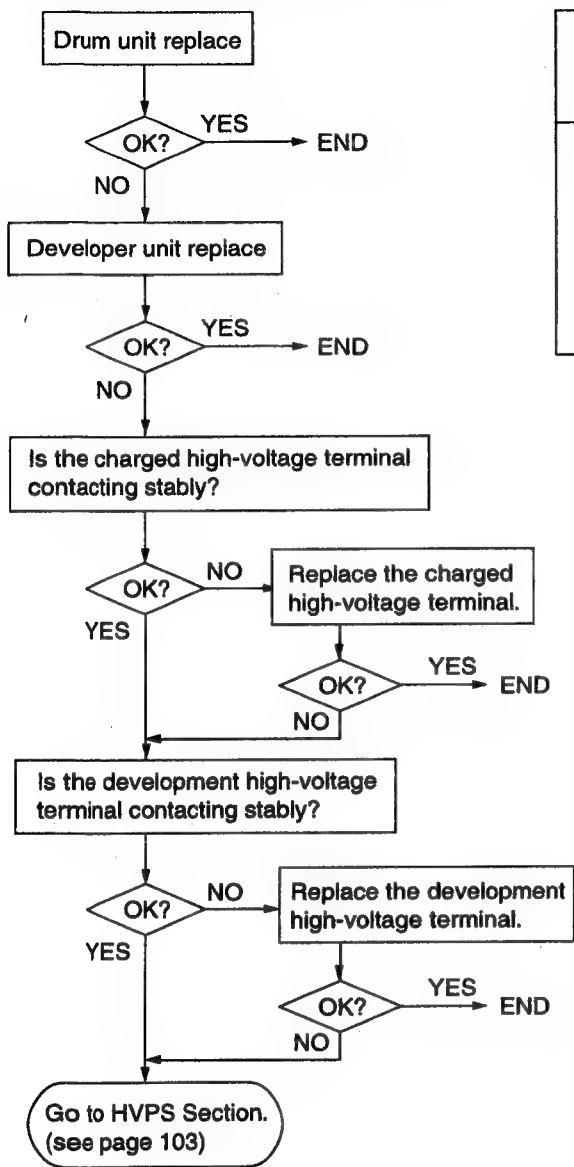
3.6-(1) Ghost Image



3.6-(2) Dark Vertical Line



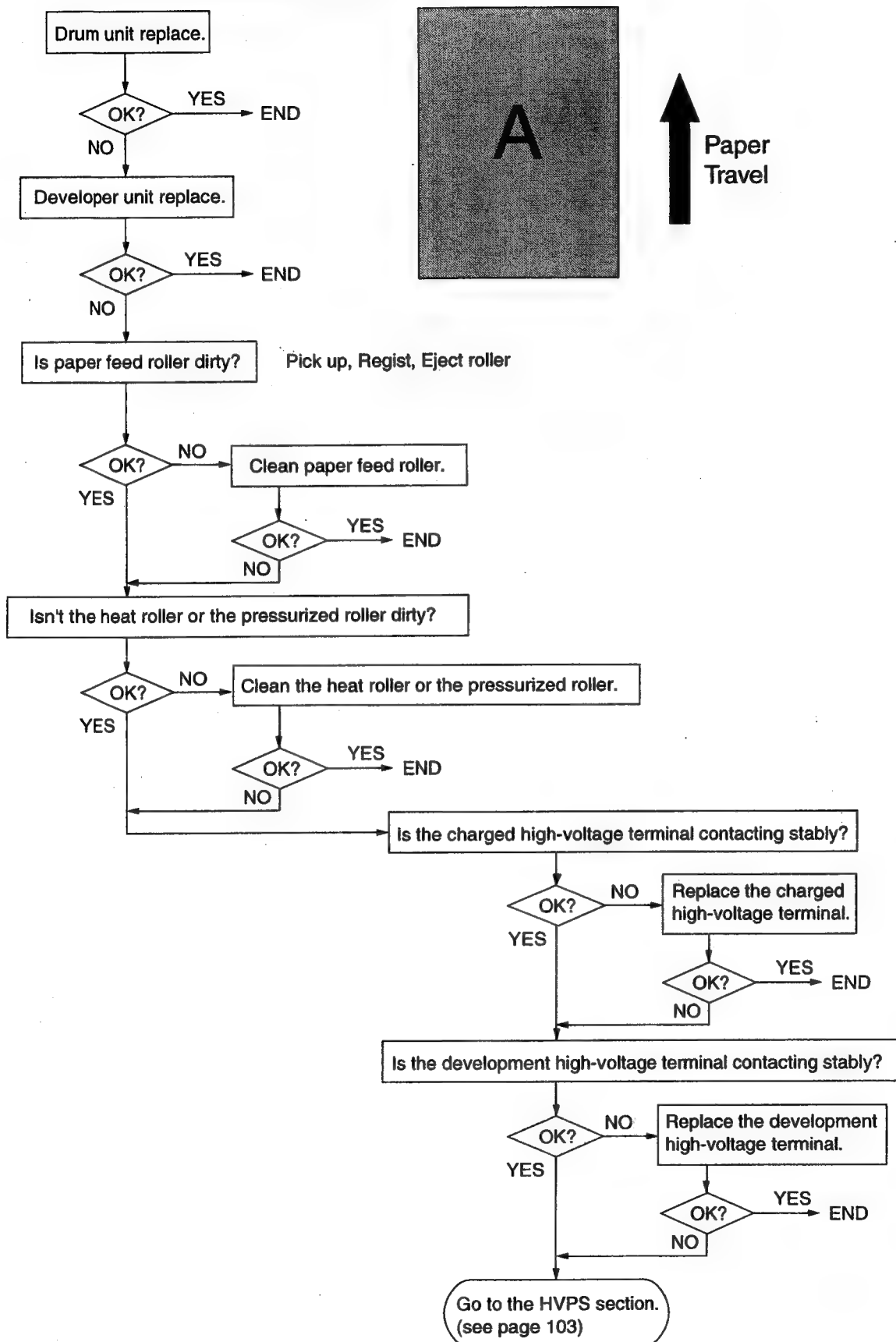
3.6-(3) Dark or White Horizontal Line



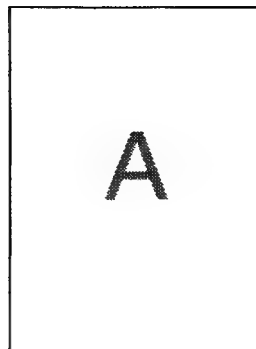
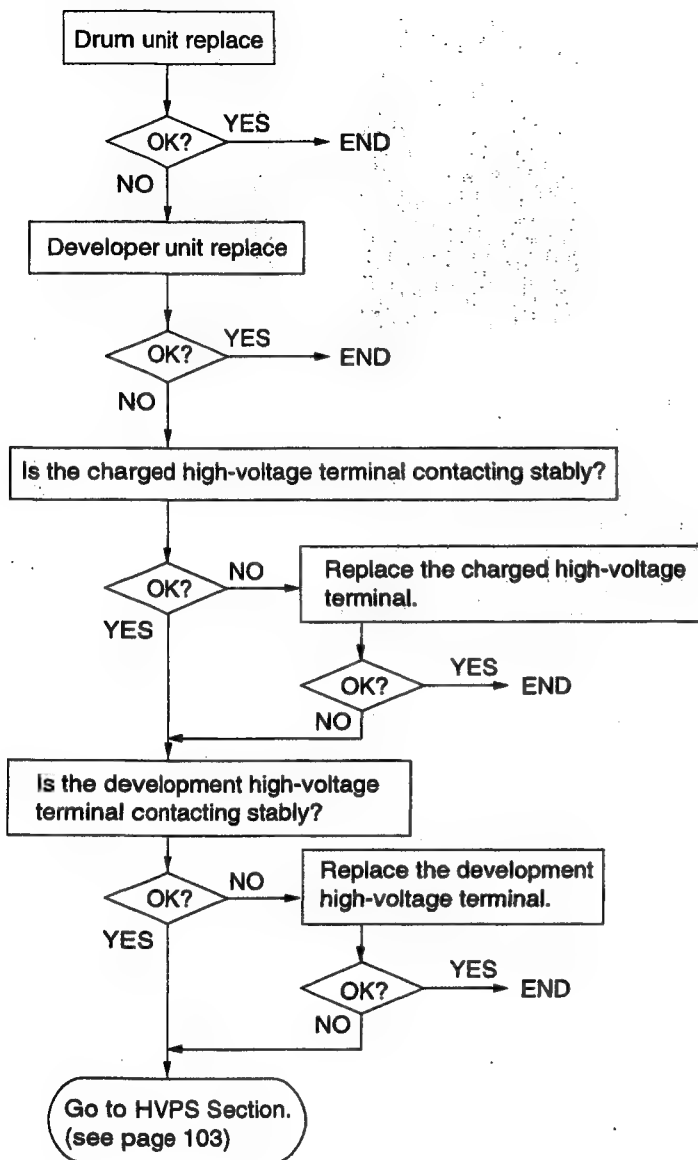
· It is necessary to describe the information about the lines that cannot be troubleshooted in such as halftone.
· When there is the information about the troubleshooted horizontal line, please add the description of it.

TROUBLESHOOTING GUIDE

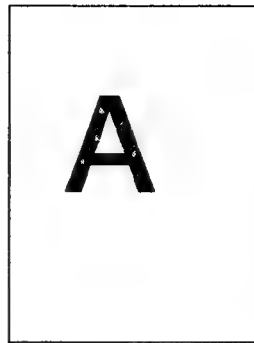
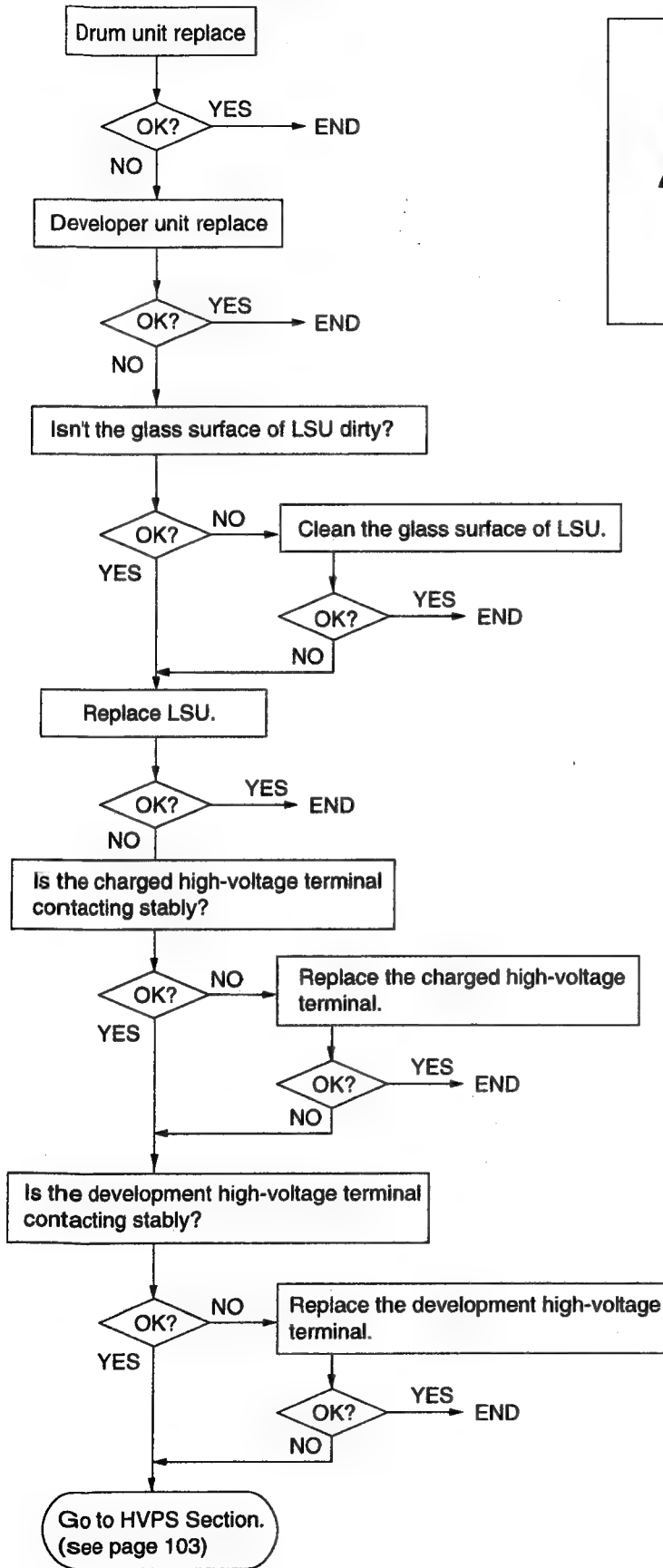
3.6-(4) Dirty and Half Darkness Background



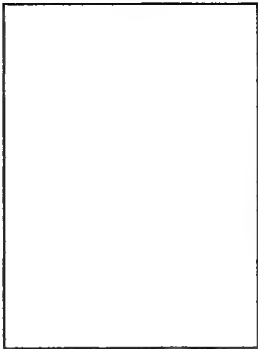
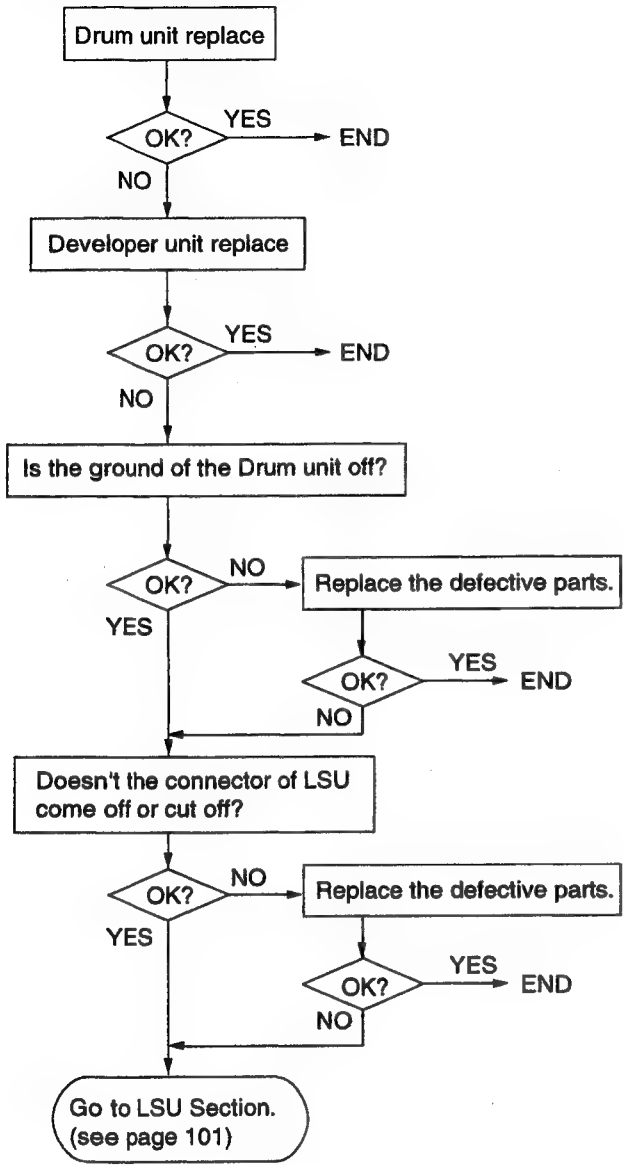
3.6-(6) Light Print



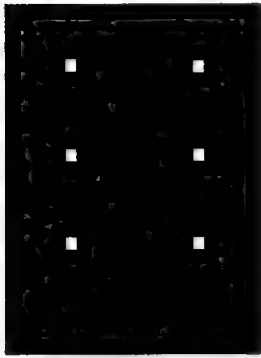
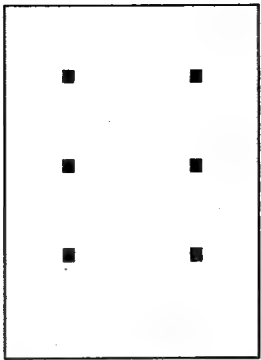
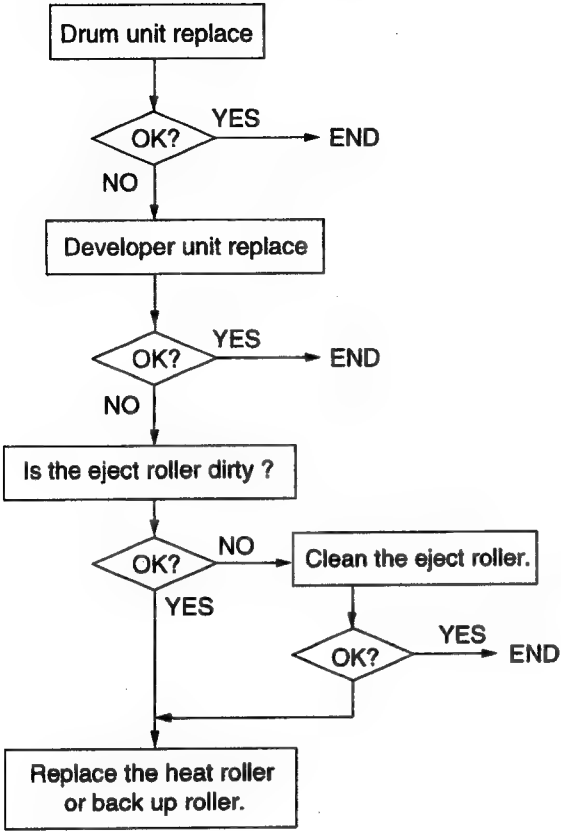
3.6-(7) Black density is light or uneven.



3.6-(8) Blank Print

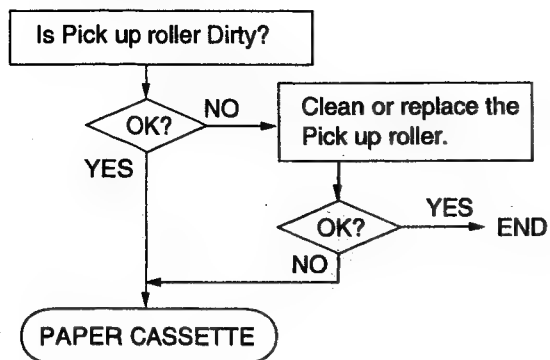


3.6-(9) Black, White Point

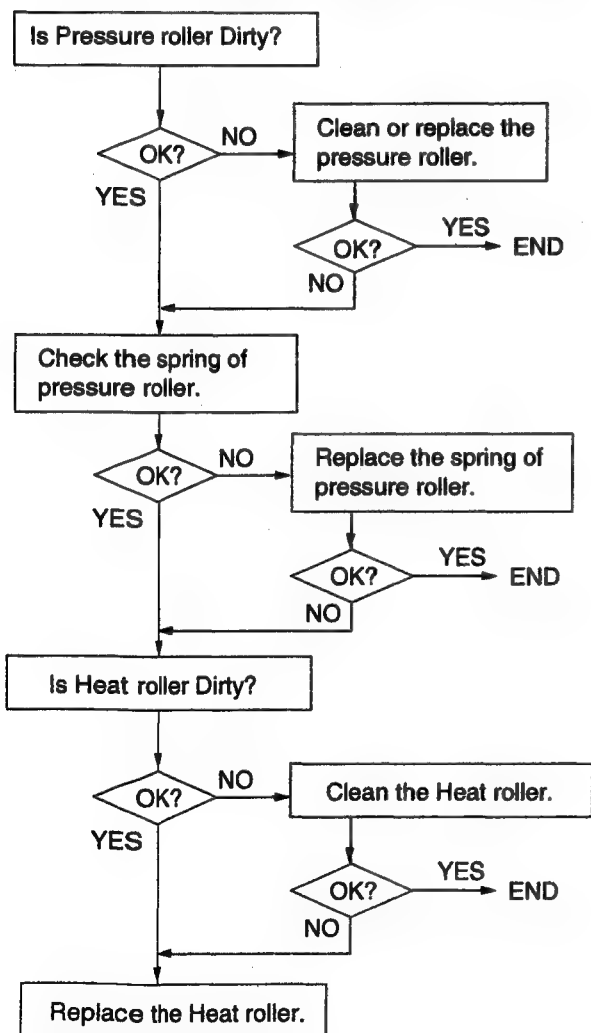


3.7 RECORDING PAPER FEED

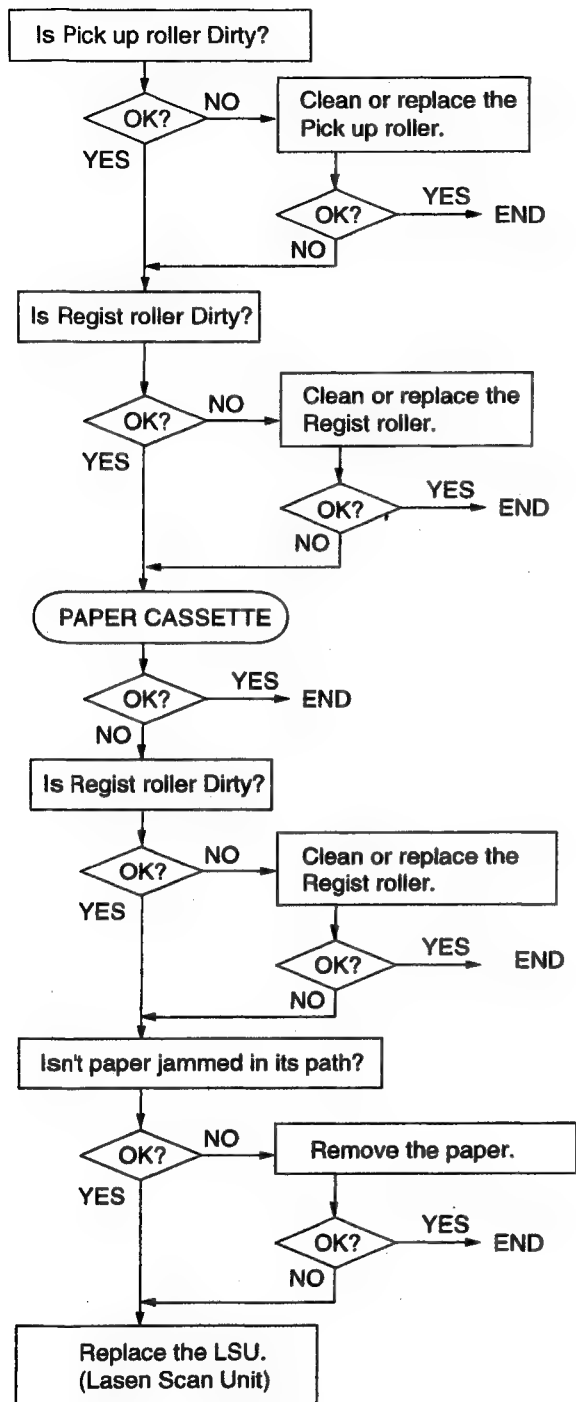
3.7-(1) Multiple feed



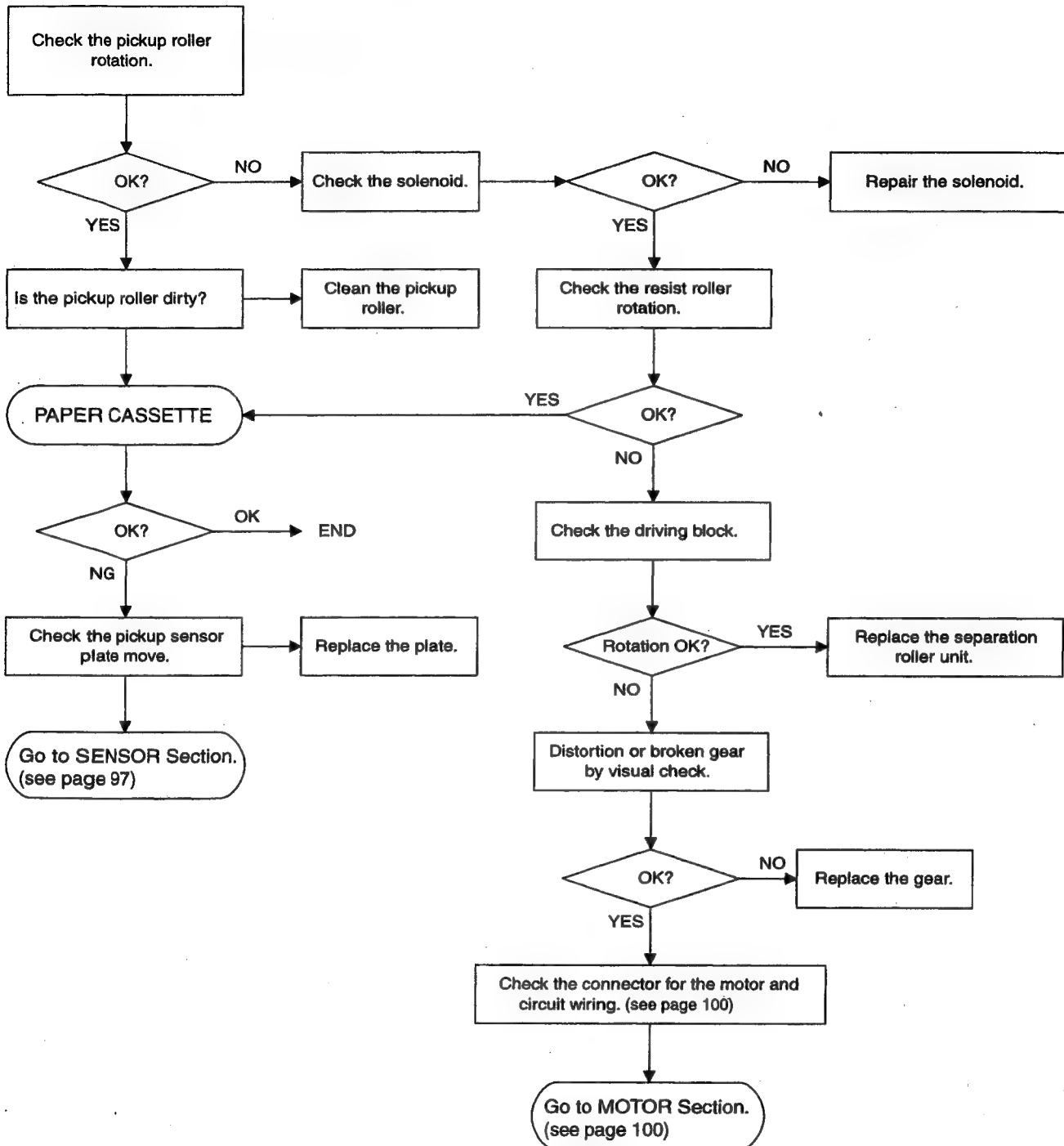
3.7-(2) The printing paper is waved or wrinkled



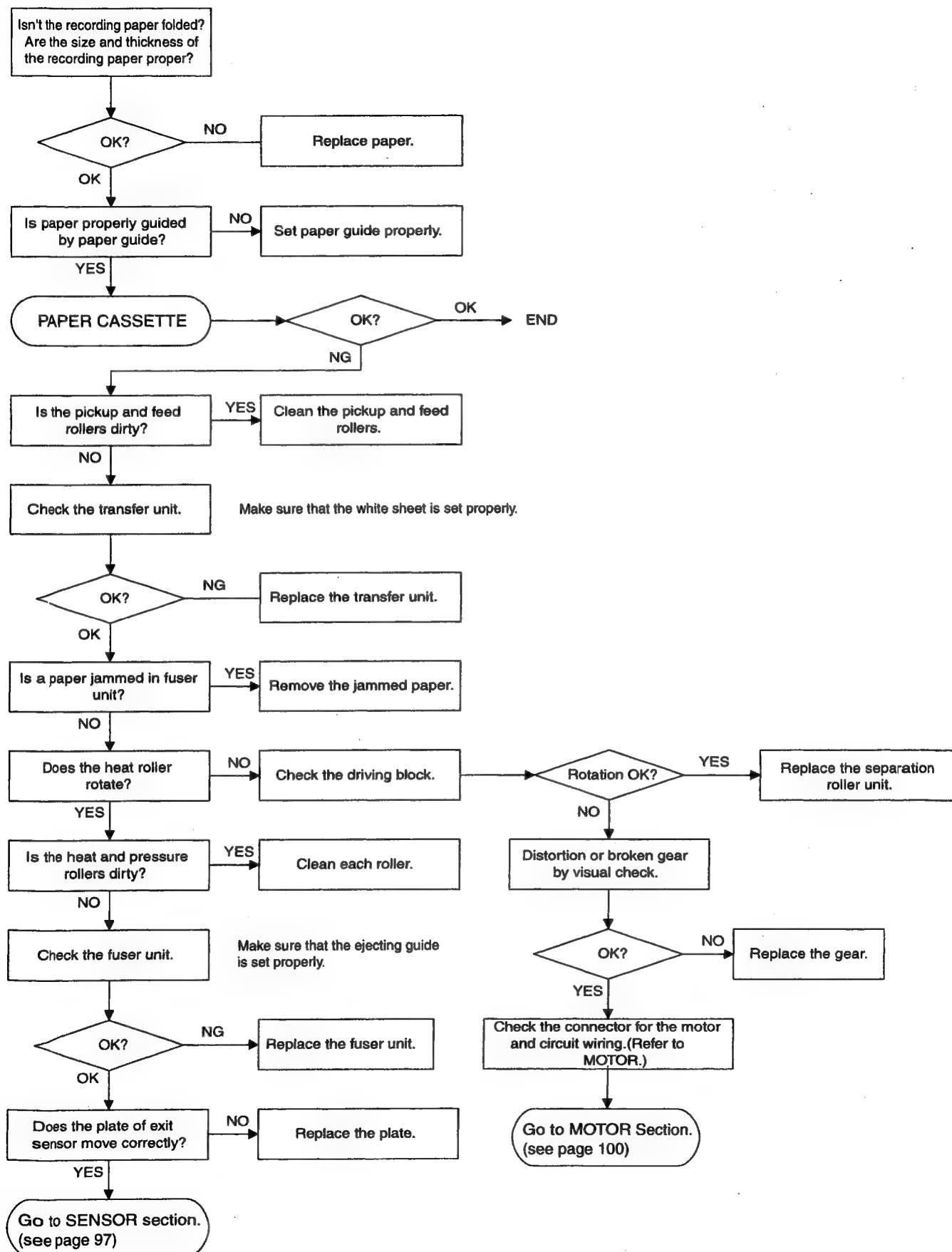
3.7-(3) Skew



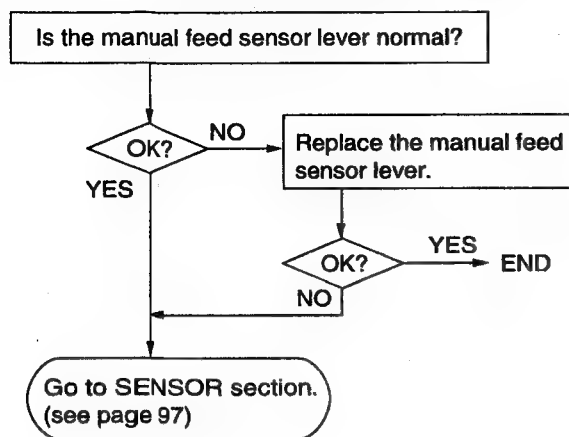
3.7-(4) The recording paper does not feed.



3.7-(5) Paper jam



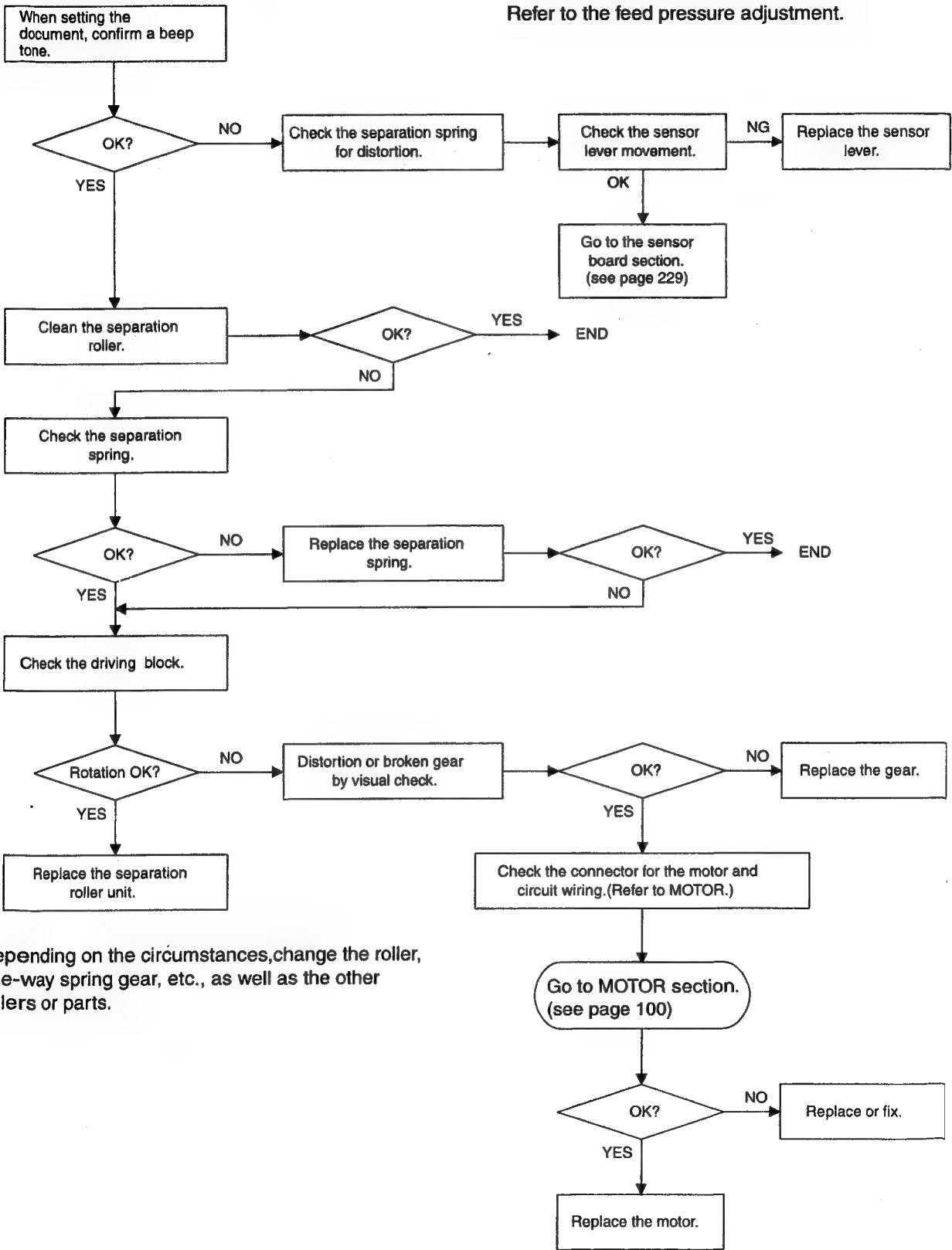
3.7-(6) The paper fed manually is not drawn in.



3.8 ADF(Auto document feed) section

3.8-(1)No document feed

*When using thin paper etc.,
sometimes the document will not feed.
Refer to the feed pressure adjustment.



Depending on the circumstances, change the roller, one-way spring gear, etc., as well as the other rollers or parts.

3.8-(2) Document JAM

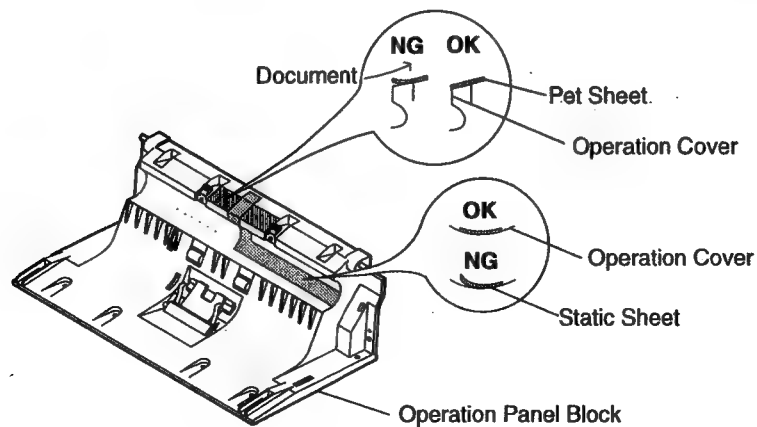
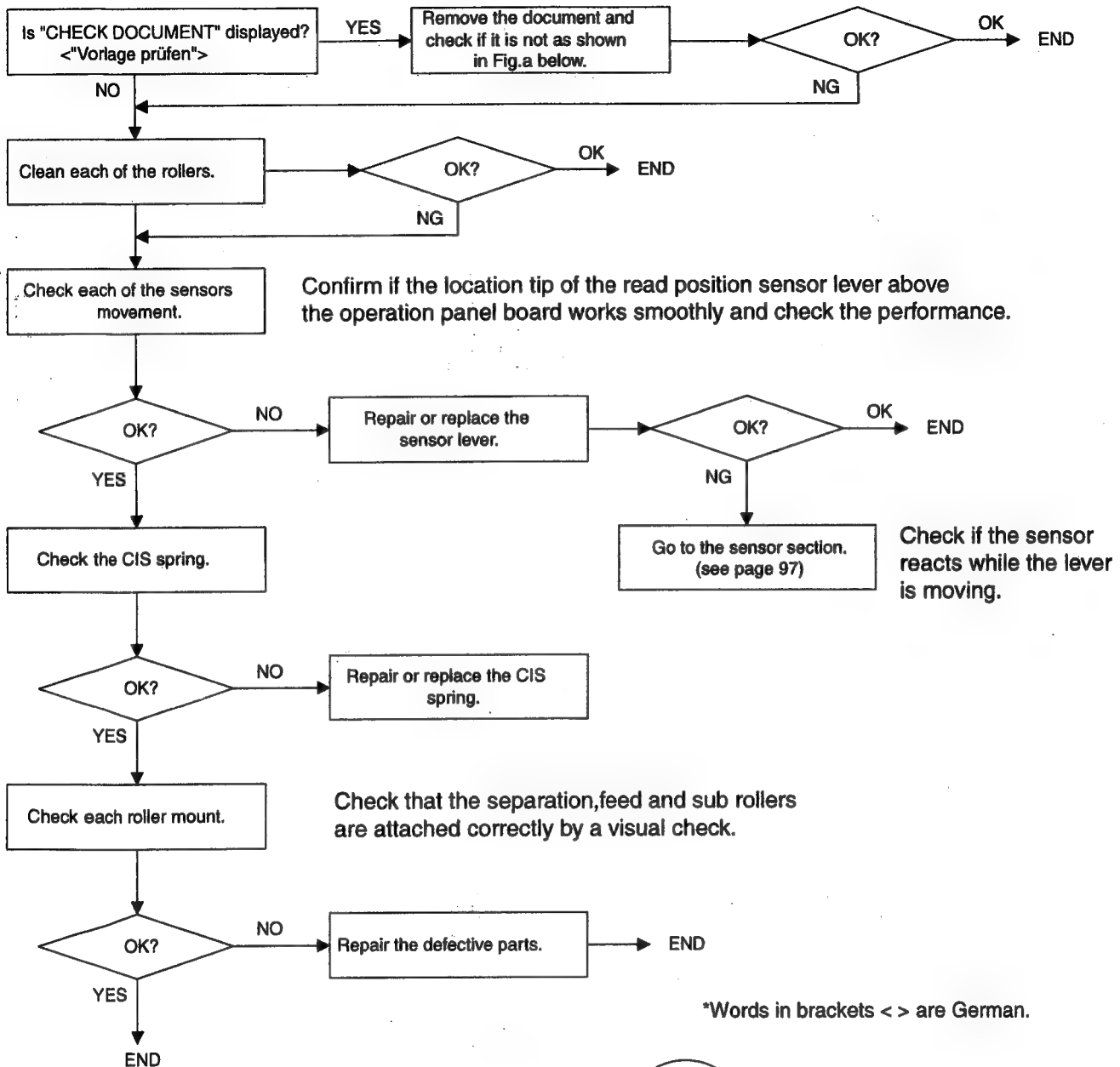


Fig a

3.8-(3) Multiple feed

When using thick paper etc., sometimes the document will not feed.

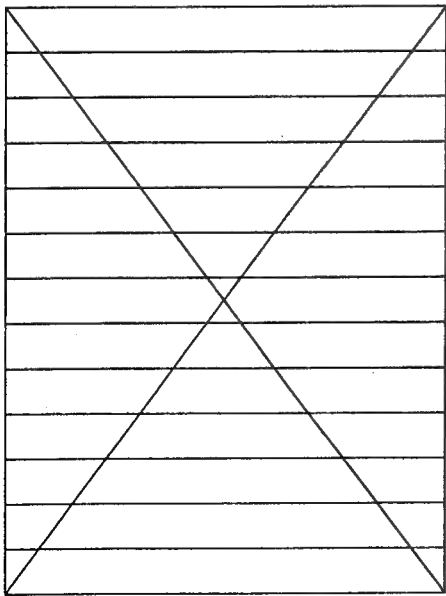
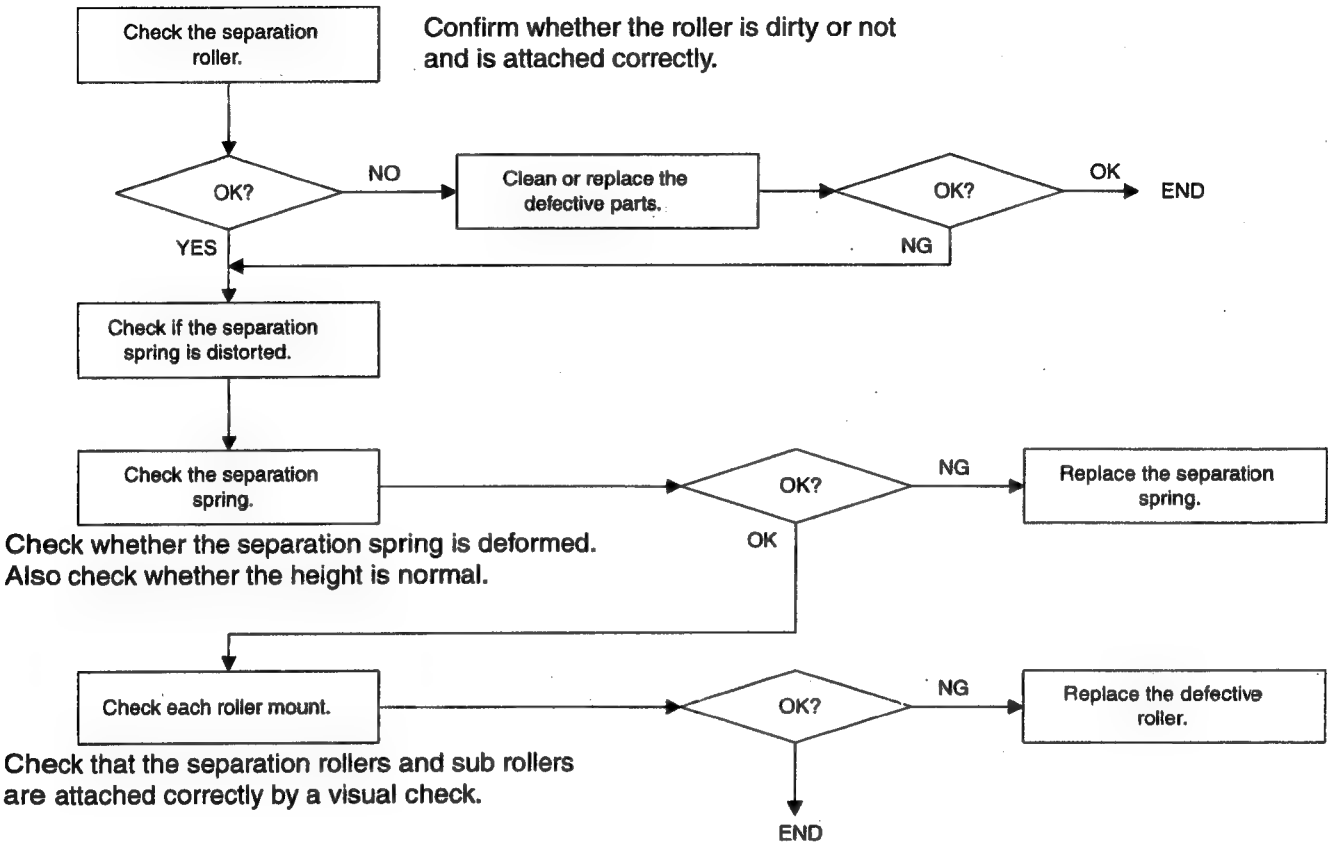
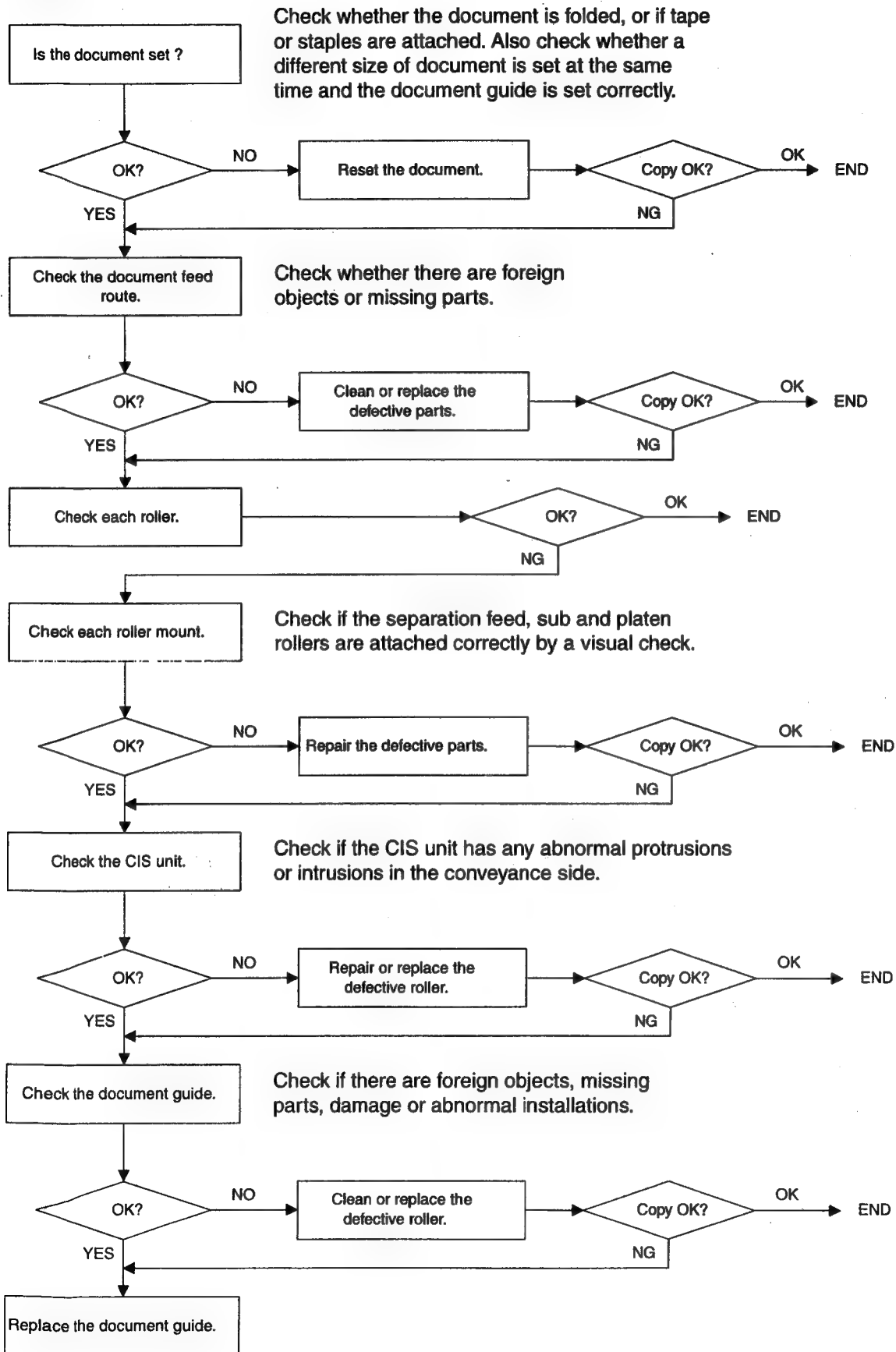


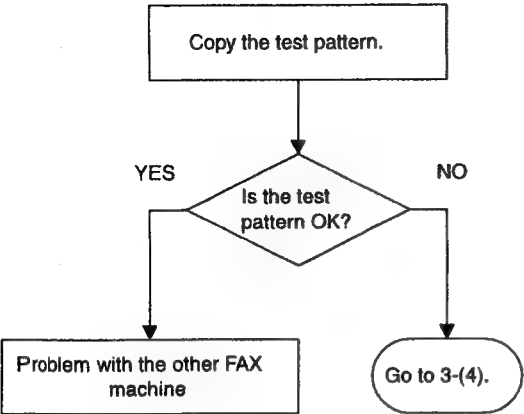
Fig b

When confirming if the characters are extended or distorted on,if the feed problem occurs,use this test chart. (Fig b)

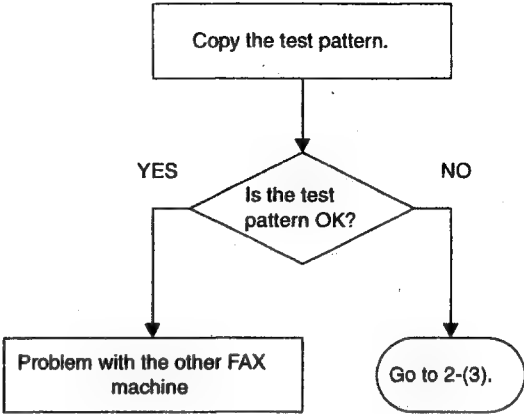
3.8-(4) Skew



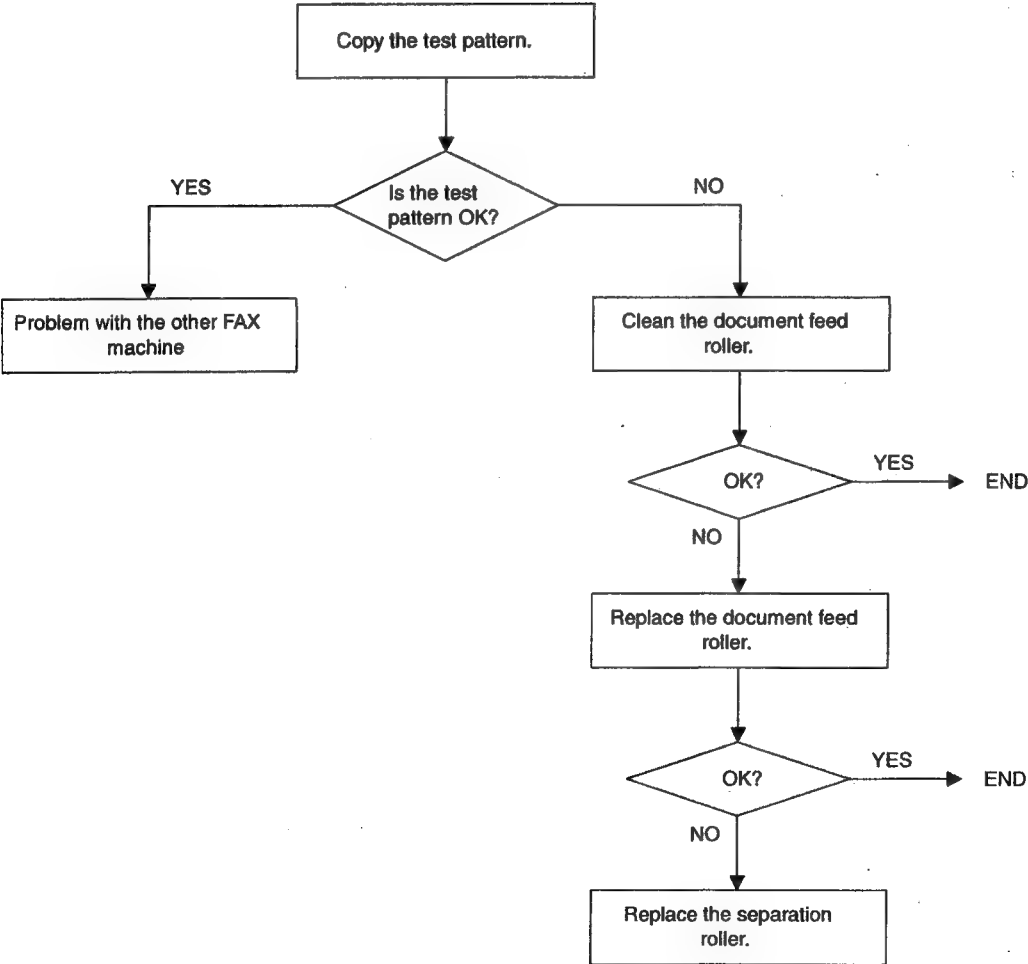
3.8-(5) The sent fax data is skewed.



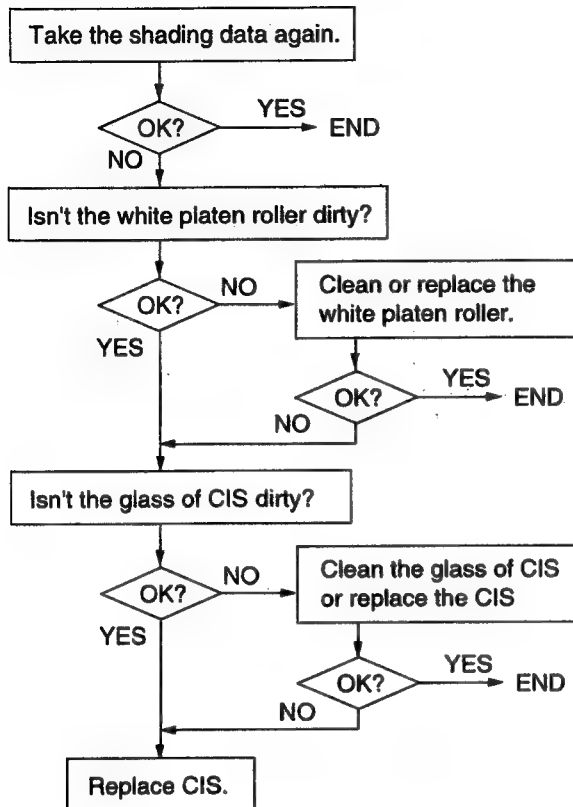
3.8-(6) The received fax data is skewed.



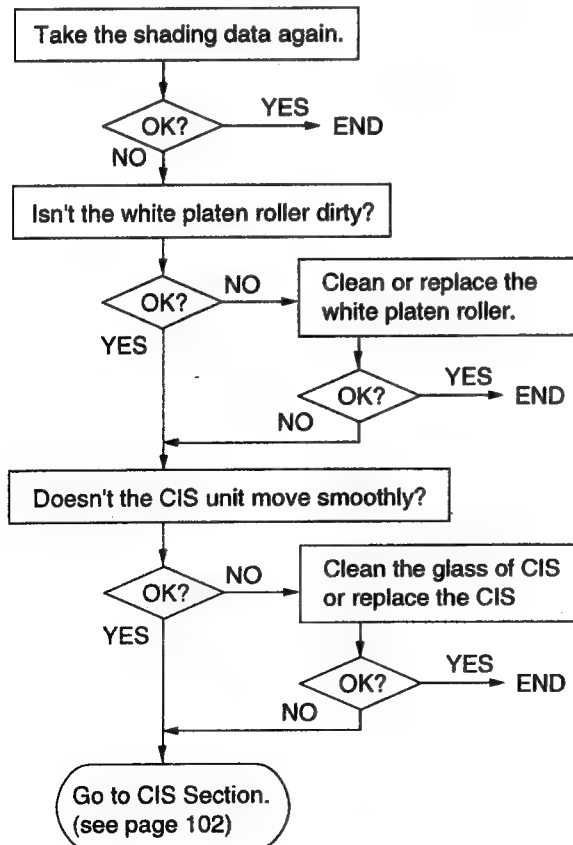
3.8-(7) The received or copied data is expanded.



3.8-(8) Black or White Vertical Line



3.8-(9) An abnormal image is copied.



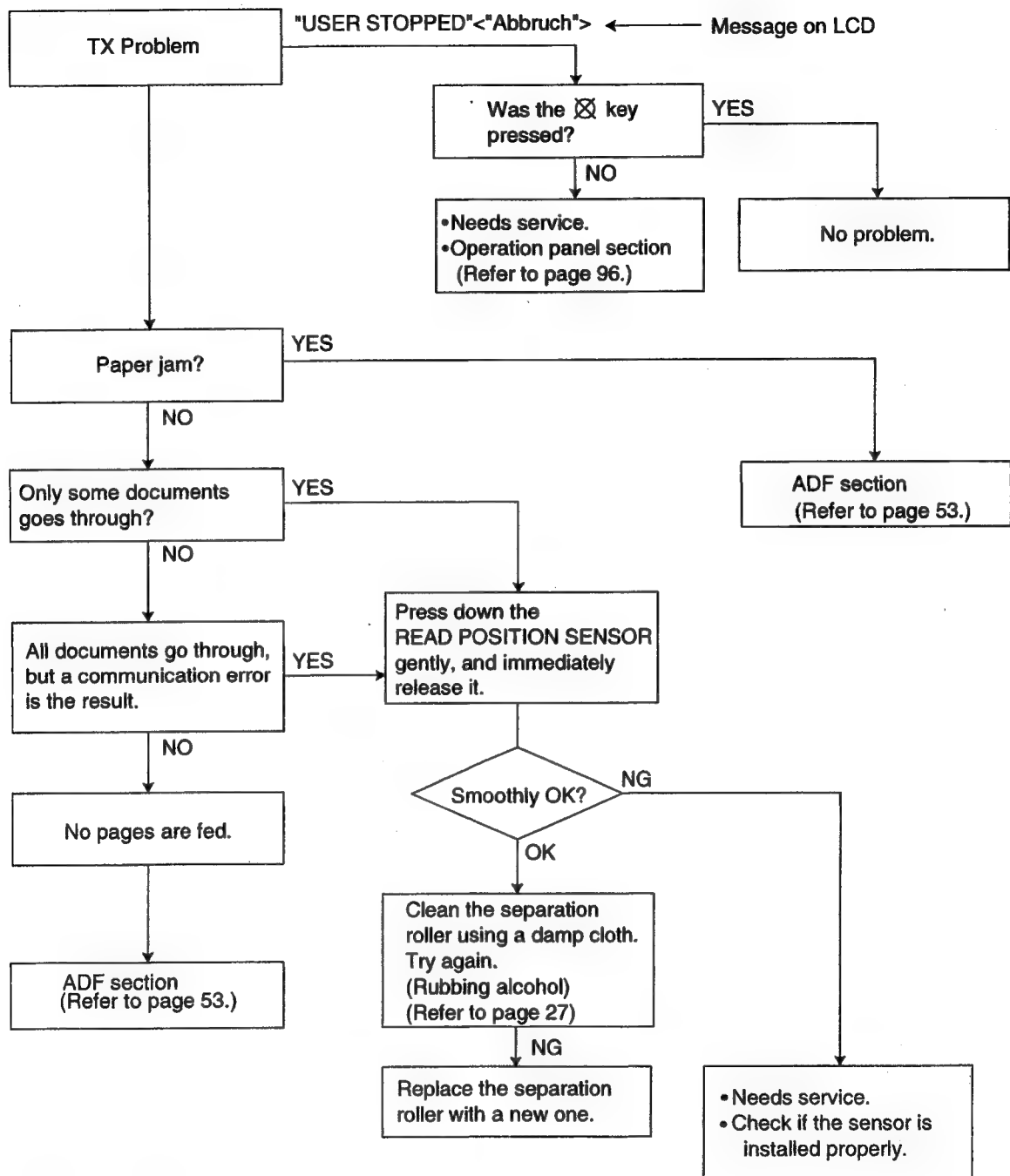
3.3.3 Communication Section

Find the problem in the table shown below, and refer to the corresponding troubleshooting procedure in the reference pages (P60 - P76).

No.	Symptom	Ref. page	Content	Possible cause
1	The paper does not feed properly when faxing. (Copying is also not possible.)	p. 60	Troubleshooting	Problem with the feeding mechanism.
2	The fax transmits successfully one time and fails another. (Copying is also possible.)	p. 61	Troubleshooting	Problem with the service line or with the receiver's fax.
3	The fax receives successfully one time and fails another. (Copying is also possible.)	p. 62	Troubleshooting	Problem with the service line or with the transmitter's fax.
4	The fax completely fails to transmit or receive. (Copying is also possible.)	p. 64	Troubleshooting	Problem with the electric circuit.
5	The fax fails either to transmit or receive when making a long distance or international call. (Copying is also possible.)	p. 65 ~ p. 67	Detailed description of the possible causes (Similar to troubleshooting items No.2 and No.3.)	Problem with the service line.
6	The fax image is poor when transmitting or receiving during a long distance or international call.	p. 67		
7	No.1-No.5	p. 68 ~ p. 76	The troubleshooting procedure for each error code will be printed on the communication result report.	

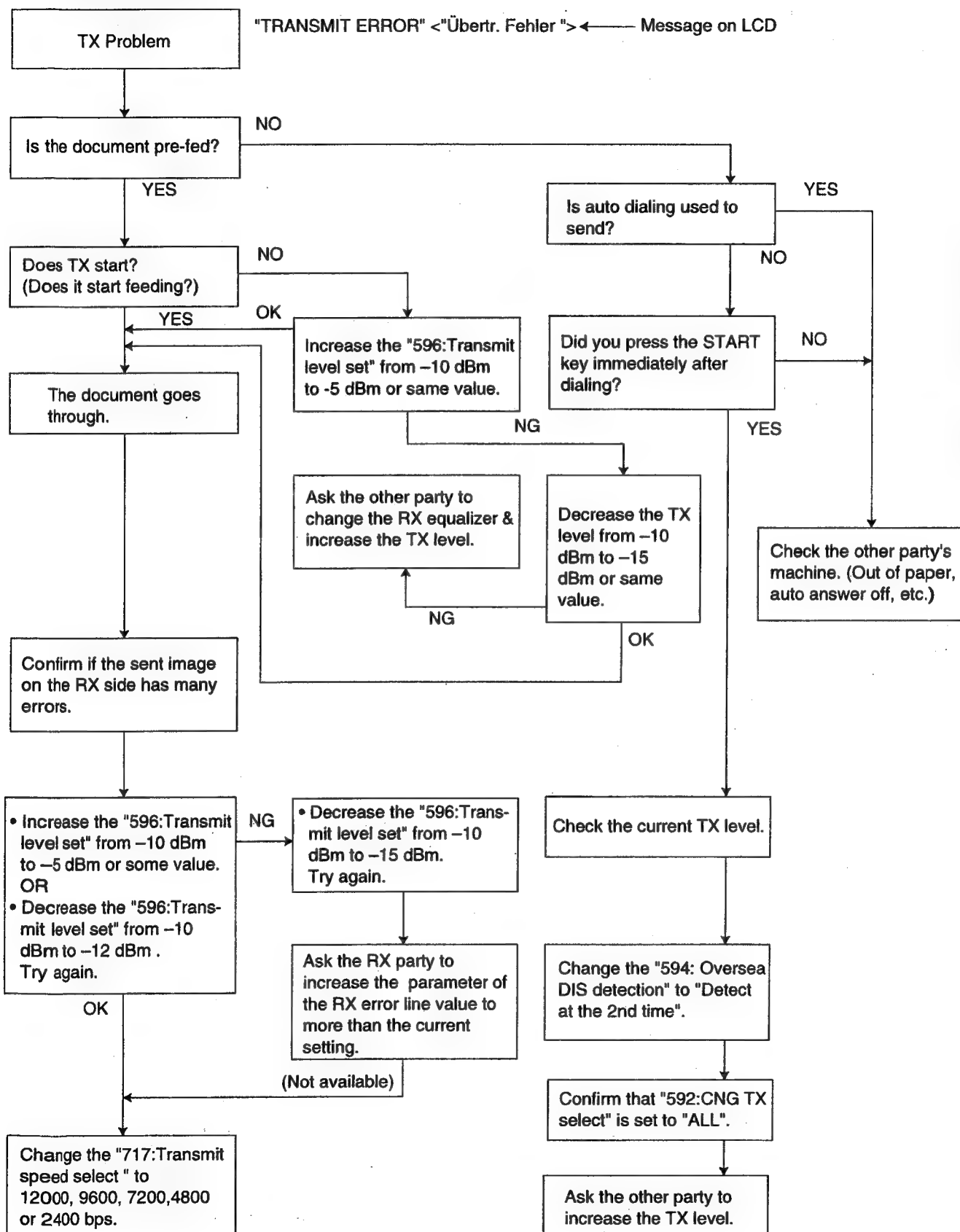
1) Defective facsimile section

① Transmit problem



*Words in brackets < > are German.

② Sometimes there is a transmit problem.



Note: "596: Transmit level set" represents a service code. (Refer to page 119.)
Refer to the Service Function Table.

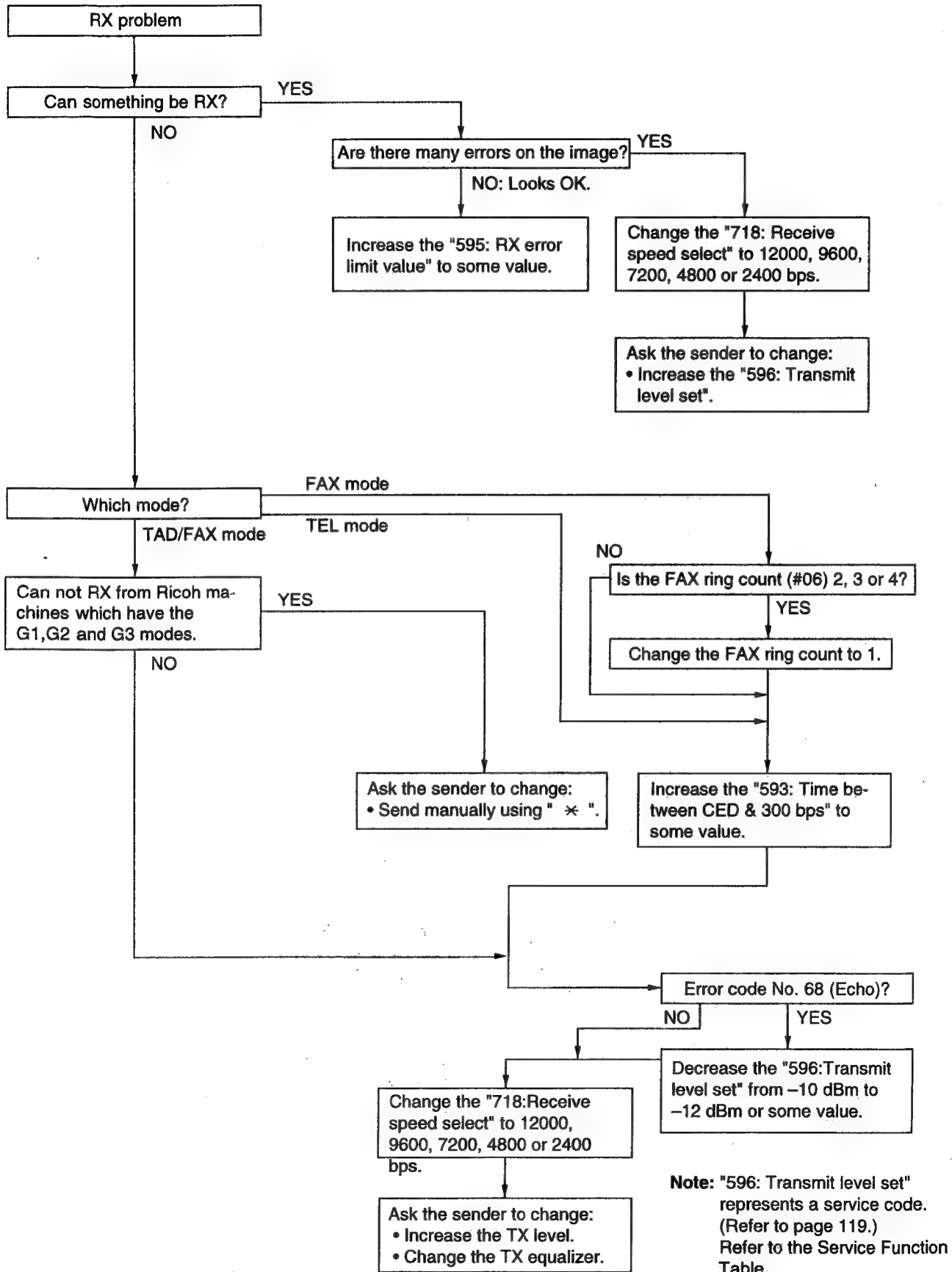
*Words in brackets < > are German.

KX-FLM600G

③ Receive problem

Confirm the following before starting troubleshooting.

- Is the recording paper installed properly? Refer to the next page.



Note: "596: Transmit level set" represents a service code. (Refer to page 119.) Refer to the Service Function Table.

For the receiving problem, we have thought of causes other than in the software. Some causes may be when the fax changes to the memory receiving mode (for example, when out of paper), and the memory becomes full of the unprinted fax data. In this case, [MEMORY FULL] <Speicher voll> and its main cause (for example, "OUT OF PAPER" <"Papier alle">) are displayed on the LCD.

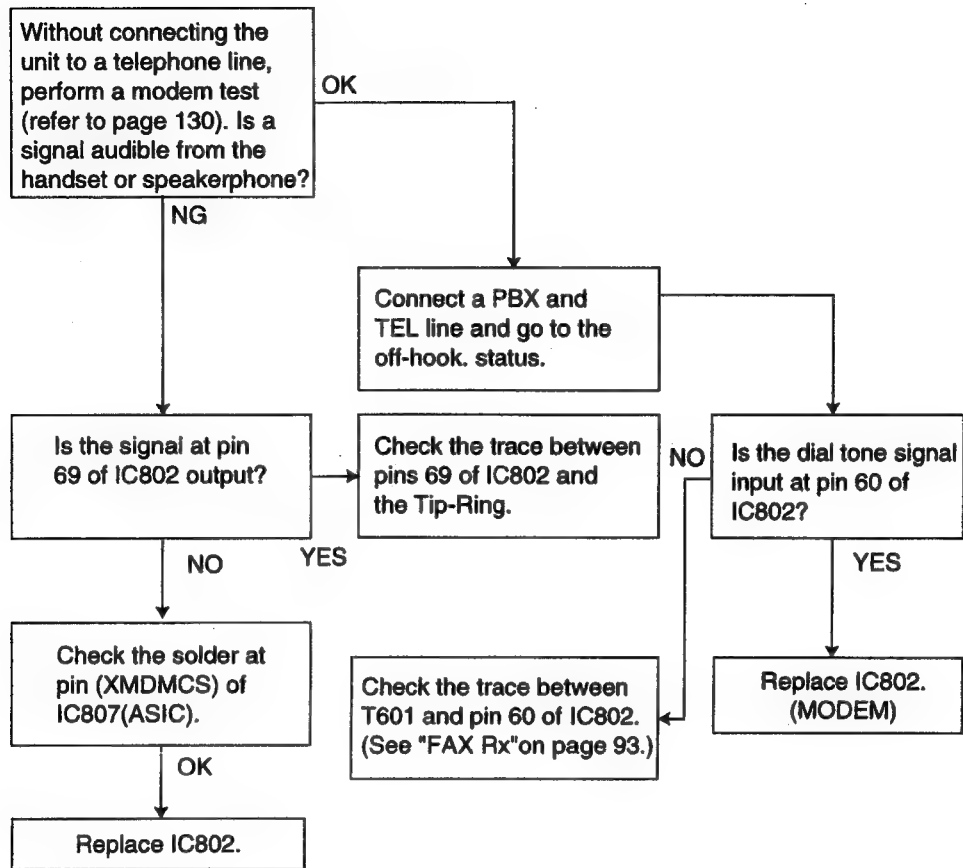
Accordingly, by solving the main problem, [SMEMORY FULL] <Speicher voll> can be canceled and the receiving problem can be solved. The causes of the display errors are shown below.

OUT OF PAPER <Papier alle>
CHECK TONER <Prüfe Toner>
TONER EMPTY <Toner alle>
CALL SERVICE <Service notw>
CHANGE DRUM <Trommel wechsel>
TOP COVER OPEN <Deckel offen>
FAILED PICK UP <Fehleinzug>
PAPER JAMMED <Papierstau>
CHECK DRUM <Prüfe Trommel>
MEMORY FULL <Speicher voll>

Please refer to "2. User Recoverable Errors" (Refer to page 30) for the above items.

Also, when it actually becomes a hardware deformity, please check each sensor. (Refer to page 131.)

*Words in brackets < > are German.

④ The unit can copy, but cannot transmit/receive.

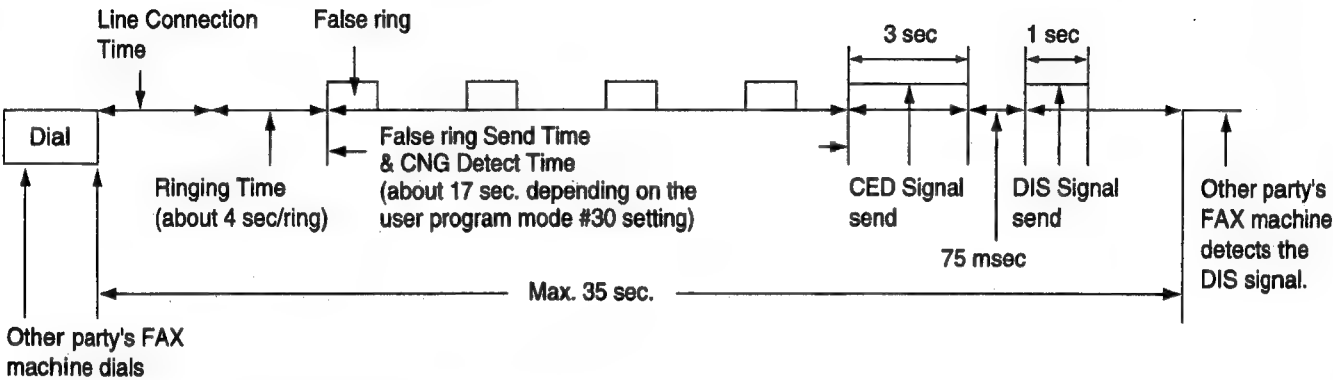
⑤ The unit can copy, but cannot either transmit/receive long distance or international communications.

The following 2 causes can be considered for this.

Cause 1:

The other party is executing automatic dialing, the call has been received by this unit, and the CED or DIS signal response time is too long. (In most cases, this unit detects the CNG signal and can respond to CED or DIS.)
(According to the ITU-T standard, the communication procedure is stopped when there is no response from the other party within 35 sec, so that the other party releases the line.)

(Response Time)



TROUBLESHOOTING GUIDE

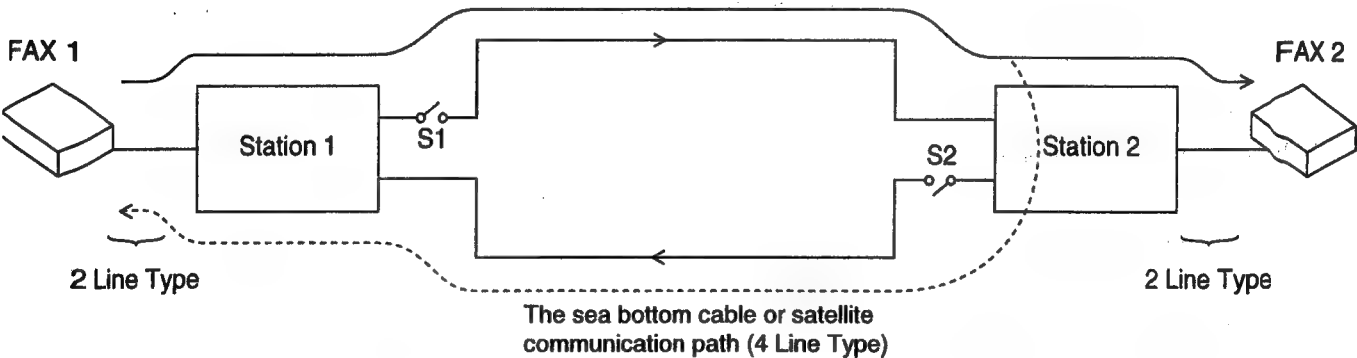
(Cause and Countermeasure)

As shown in the chart above, the total handshaking time must be reduced, but because of the long distance connection and linking of several stations, the line connection time cannot be reduced. Accordingly, the following countermeasures should be tried.

- (A) As the 35 sec. count is started directly after dialing or directly after the START button has been pressed for models with a START button, the other party should be called manually, if possible.
Another possibility is entering two pauses at the end of the auto dial number on the transmission side. Then the count start time can be delayed for 2 pauses (about 10 sec.).

Cause 2:

Erroneous detection because of an echo or an echo canceler.



(Echo/Echo Canceler)

The signal from FAX1 reaches FAX2 via stations 1 and 2, but the reflection signal at station 2 also returns via station 1 (echo). As the distance between station 1 and station 2 is far, the echo returns to FAX 1 at a max of 600 msec after transmission. There is a possibility that this signal is detected erroneously as the signal from FAX2. For a normal call, there is also a possibility that the echo of their own voice will make the call difficult to understand. For this reason, each station (station 1 and station 2) attaches echo cancelers (S1 and S2) for international lines or long distance lines. For the echo canceler, the level of the transmission signal from FAX 1 is compared with the level of the reception signal from FAX2. When the transmission signal is larger, S1 is closed while S2 is opened when it is smaller. In other words, for transmission from FAX1, S1 is closed and S2 is open, so that the echo does not return to FAX 1.

(Causes and Countermeasures)**(Cause A)**

When a training signal is transmitted from FAX1 during the communication procedure at the time of transmission from FAX1 to FAX2, there is a delay until the echo canceler operates. S1 is closed so that a part of the head of the training signal may drop out. Normal reception by FAX2 may not be possible, and transmission may not be started.

(Countermeasure A)

When the international line mode is ON in the service mode (code No. 521), a dummy signal is attached to the head of the training signal to prevent this problem. As this normally is ON, it is necessary to reconfirm that this has not become OFF. When the international mode is switched OFF, the transmission side will try the training signal three times at each speed (9600BPS, 4800BPS and 2400BPS). If NG, it will drop the speed by one rank (fall-back). When the international mode is switched ON, each speed will be tried only twice. In other words, the slower speed with fewer errors can be accessed more easily. This is done because the line conditions may deteriorate and the picture may be disturbed more easily during communication for international lines or long distance communication, even when the training is OK. The default value is ON as preference is given to clearer pictures rather than speed.

(Cause B)

The echo canceler operation is stopped with a 2100Hz signal. (i.e. S1 and S2 become ON).

Accordingly, when FAX1 has executed automatic reception, a CED signal is output. If this signal is 2100Hz, S1 and S2 will become ON. Then the echo of the DIS signal output afterwards may be received and FAX1 may execute an erroneous operation, preventing communication from starting.

(Countermeasure B)

In the service mode, the CED signal frequency is set to 1100 Hz (code No.520), or the time setting between the CED signal and the DIS signal is set from 75 msec to 500 msec in the service mode (code No.593). This is because the echo canceler operation stop mode is canceled by an interval of 250 msec or more.

(Cause C)

This model is FAX1 and the other party is FAX2.

For transmission from this model to FAX2, FAX2 executes automatic reception and transmits a CED signal (2100 Hz) followed by a DIS signal. As the echo canceler stops as described in cause B, the echo of the DIS signal returns to FAX2. On the other hand, this model detects the DIS signal and transmits a DCS signal. In other words, it is possible that the echo of the DIS signal and the DCS signal transmitted from this model reach FAX2 one after the other. FAX2 detects an error and communication is not started.

Reduce receiving sensitivity to reduce the effect of RCV echo signal.(code No.598)

(Countermeasure C)

When the international DIS detection setting is set in the service mode (code No.594), this model does not respond to the first DIS signal and returns a DCS signal only for the second DIS signal.

In other words, there is an interval of 250 msec between transmission of the first and second DIS signal so that the echo canceler operation recovers. An echo is not generated for the second DIS signal.

Note:

When the other FAX does not respond with a DCS signal after DIS signal transmission, the DIS signal is transmitted three times for trial.

Summary:

Long distance and international communication operations

SYMPTOM	COUNTERMEASURE
Does not receive in the automatic mode.	<ol style="list-style-type: none"> 1. If possible, manual transmission should be done from the transmission side. 2. If possible, two pauses should be inserted at the end of the auto dial number on the transmission side. 3. If possible, the Function Selector Switch should be switched to FAX.
Does not transmit.	<ol style="list-style-type: none"> 1. Confirm the international line mode is ON. (Service mode: code No. 521) 2. Enable the international DIS detection setting. (Service mode: code No. 594)
Does not receive.	<ol style="list-style-type: none"> 1. Set the time setting between the CED signal and the DIS signal to 500 msec. (Service mode: code No. 593) 2. Set the CED frequency to 1100Hz. (Service mode: code No. 520) 3. Reduce the RCV sensitivity (service mode: codeNo.598)

⑥The unit can copy, but the transmission and reception image are incorrect.
(Long distance or international communication operation)

This widely depends on the transmission and reception capability of the other FAX unit and the line conditions.
 The countermeasures for this unit are shown below.

Transmission Operation:

Set the transmitting speed to 4800BPS (service mode: code No. 717) or select the overseas mode.

Reception Operation:

If 80% or more of the reception is incorrect, set the receiving speed to 4800BPS. (Service mode: code No. 718)

- Refer to page 117 for the service mode's code setting.

KX-FLM600G

⑦ How to output the Journal Report:

1. Press the MENU button.
2. Press "#", then "8" and "4".
3. Press the **(START/SET/COPY)** (**START/☺/KOPIE**) button.
4. The report prints out.

Sample of a journal report

*Words in brackets () are German.

This number indicates the page which received RTN signal in sending. The sending page including Error lines.

FEDERAL		25 Jan. 1999 17:22					
		Ihr Logo :					
		Teilnehmerkennung :					
Nr.	Gegenstelle	Start-Zeit	Übertragungszeit	Modus	Seiten	Ergebnis	*Code
01	1234567	21 Jan. 14:14	00'25	SENDEN	01	OK	
02	9998765	21 Jan. 14:17	00'38	SENDEN	02	OK	
03	2121444	21 Jan. 14:18	00'28	EMPF	01	OK	
04	55556677	22 Jan. 10:35	06'58	SENDEN	10(02,04,05)	Komm. Fehler	43
				SENDEN	05	OK	
				SENDEN	03	OK	

(3) TX(SENDEN): Sent directly (2) Communication message (1) Error code
RX(EMPF): Received directly

⑧ Error code table

RCV:Received directly

(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Counter-measure (go to the next page)
	PRESSED THE STOP KEY	TX & RX	Communication was interrupted by the STOP button.	
	DOCUMENT JAMMED	TX	The document paper is jammed.	
	NO DOCUMENT	TX	No document paper.	
	THE COVER WAS OPENED	TX & RX	The cover is open.	
40	NO RESPONSE	TX	Transmission is finished when the T1 TIMER expires.	1
41	COMMUNICATION ERROR	TX	DCN is received after DCS transmission.	2
42	COMMUNICATION ERROR	TX	FTT is received after transmission of a 2400BSP training signal.	3
43	COMMUNICATION ERROR	TX	No response after post message is transmitted three times.	4
44	COMMUNICATION ERROR	TX	RTN and PIN are received.	5
46	COMMUNICATION ERROR	RX	No response after FTT is transmitted.	6
48	COMMUNICATION ERROR	RX	No post message.	7
49	COMMUNICATION ERROR	RX	RTN is transmitted.	8
50	COMMUNICATION ERROR	RX	PIN is transmitted (to PRI-Q).	8
51	COMMUNICATION ERROR	RX	PIN is transmitted.	8
52	NO RESPONSE	RX	Reception is finished when the T1 TIMER expires.	9
54	ERROR-NOT YOUR UNIT	RX	DCN is received after DIS transmission.	11
58	COMMUNICATION ERROR	RX	DCN is received after FTT transmission.	13
59	ERROR-NOT YOUR UNIT	TX	DCN responds to the post message.	14
65	COMMUNICATION ERROR	TX	DCN is received before DIS reception.	2
65	COMMUNICATION ERROR	RX	Reception is not EOP, EOM PIP, PIN, RTP or RTN.	2
68	COMMUNICATION ERROR	RX	No response at the other party after MCF or CFR is transmitted.	13
70	ERROR-NOT YOUR UNIT	RX	DCN is received after CFR transmission.	13
72	COMMUNICATION ERROR	RX	Carrier is cut when the image signal is received.	16
75	MEMORY FULL	RX	The document was not received due to memory full.	
79	CANCELED	TX	The multistation transmission was rejected by the user.	
			Modem error.	
FF	COMMUNICATION ERROR	TX & RX	For the DCN, DCS, etc. abbreviations, refer to "5. Modem Section" on page 193.	12

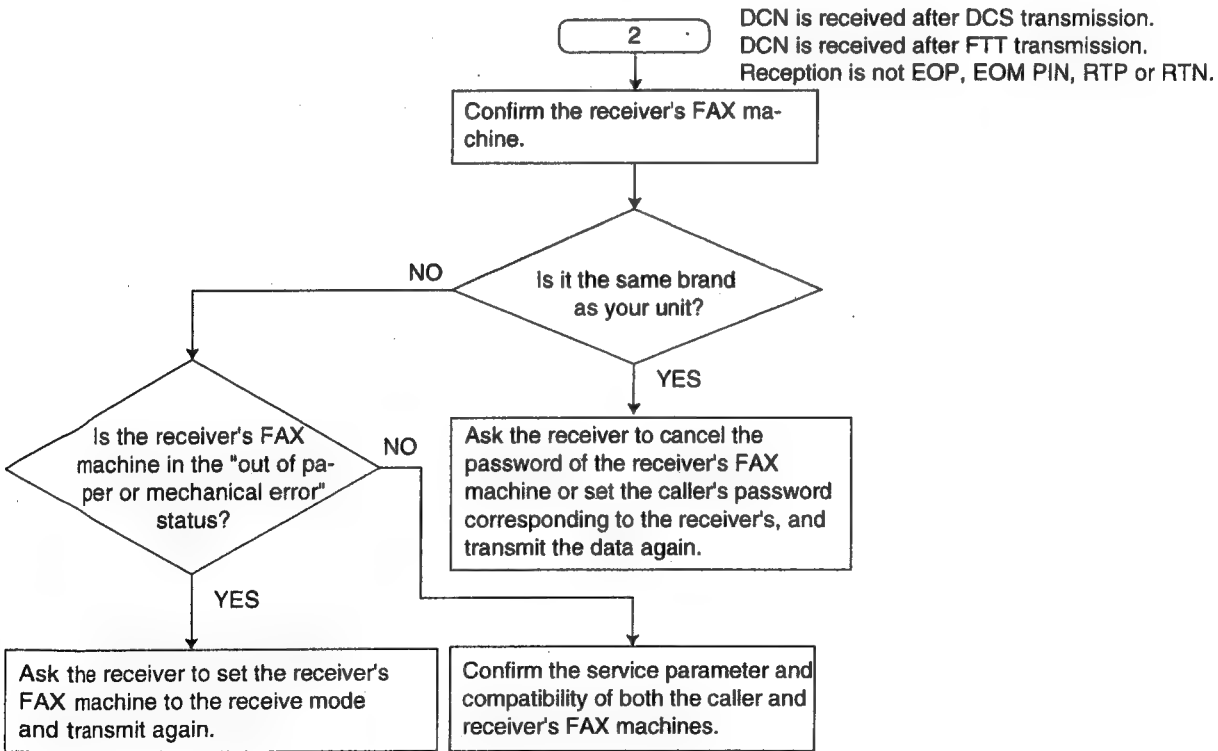
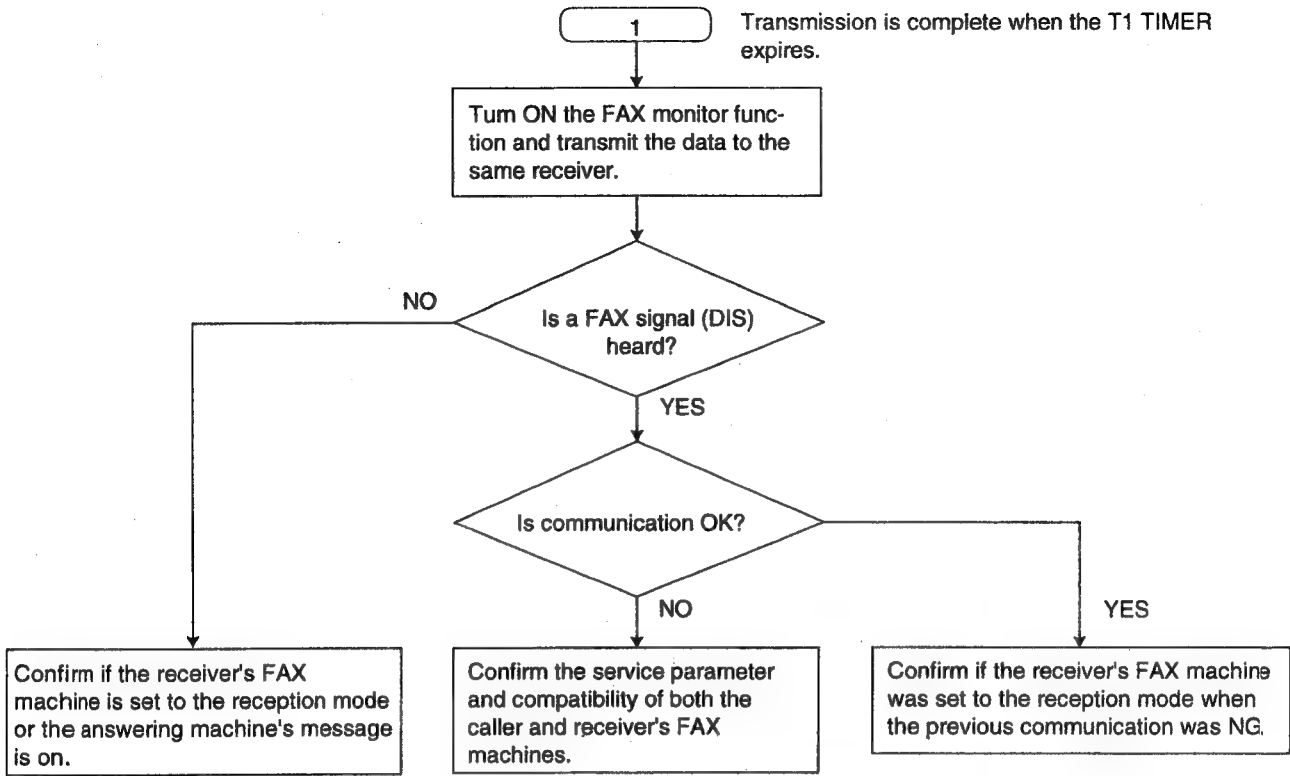
TX=TRANSMISSION RX=RECEPTION

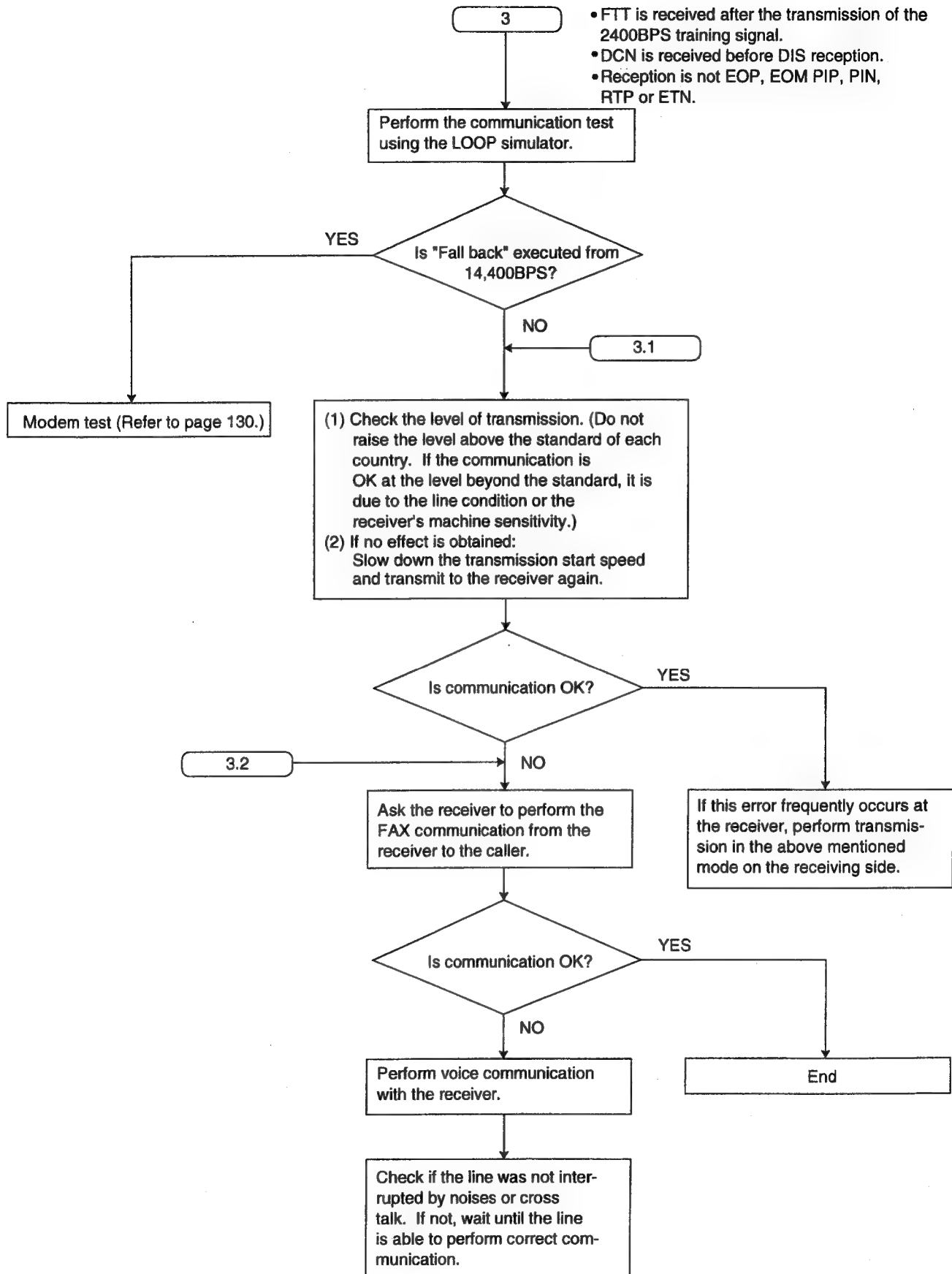
※Most fax communication problems can be resolved by the following steps.

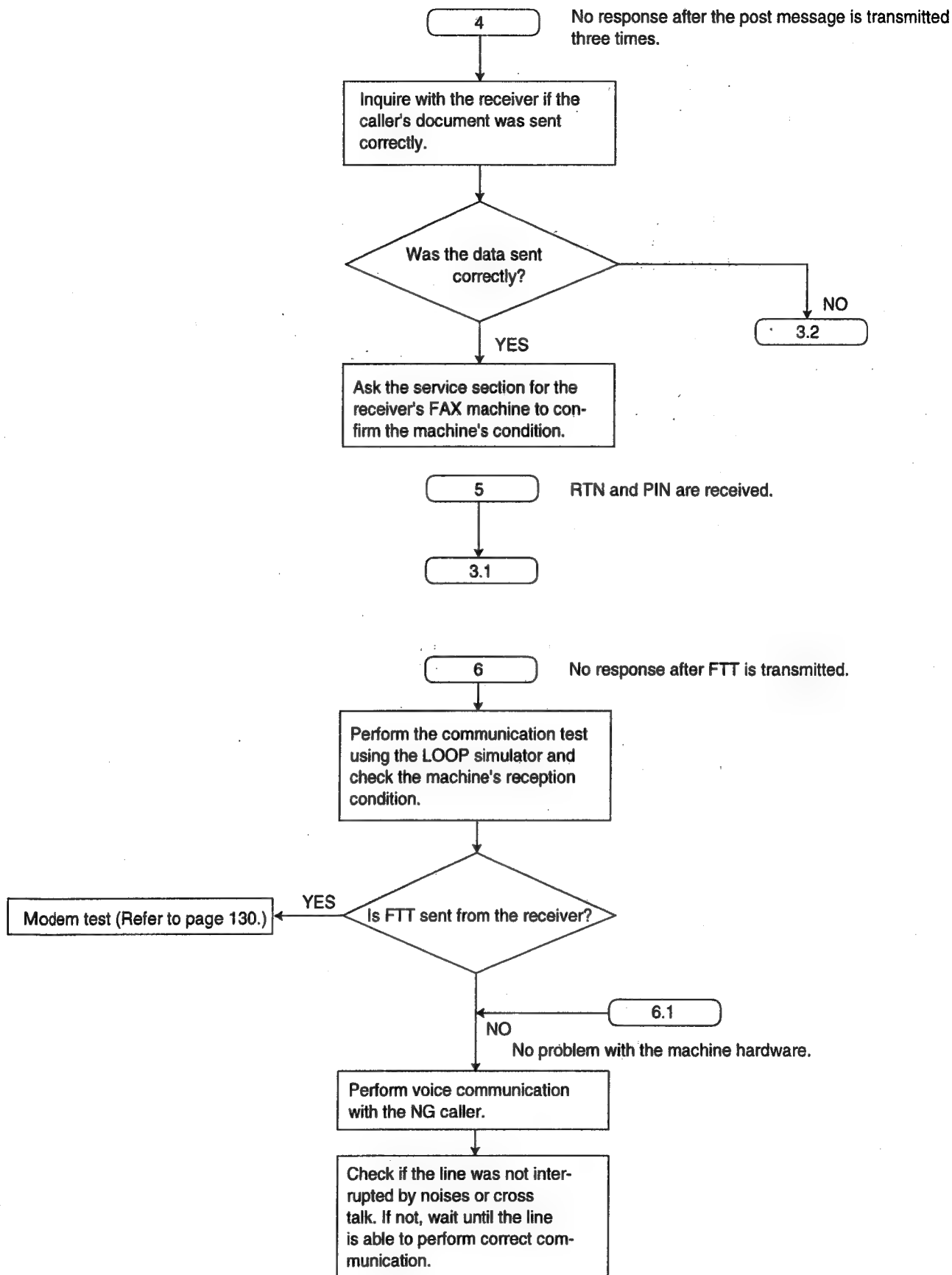
- 1) Change the transmit level. (Service code: 596, refer to page 119.)
- 2) Change the TX speed/RX speed. (Service code: 717/718, refer to page 119,120.)

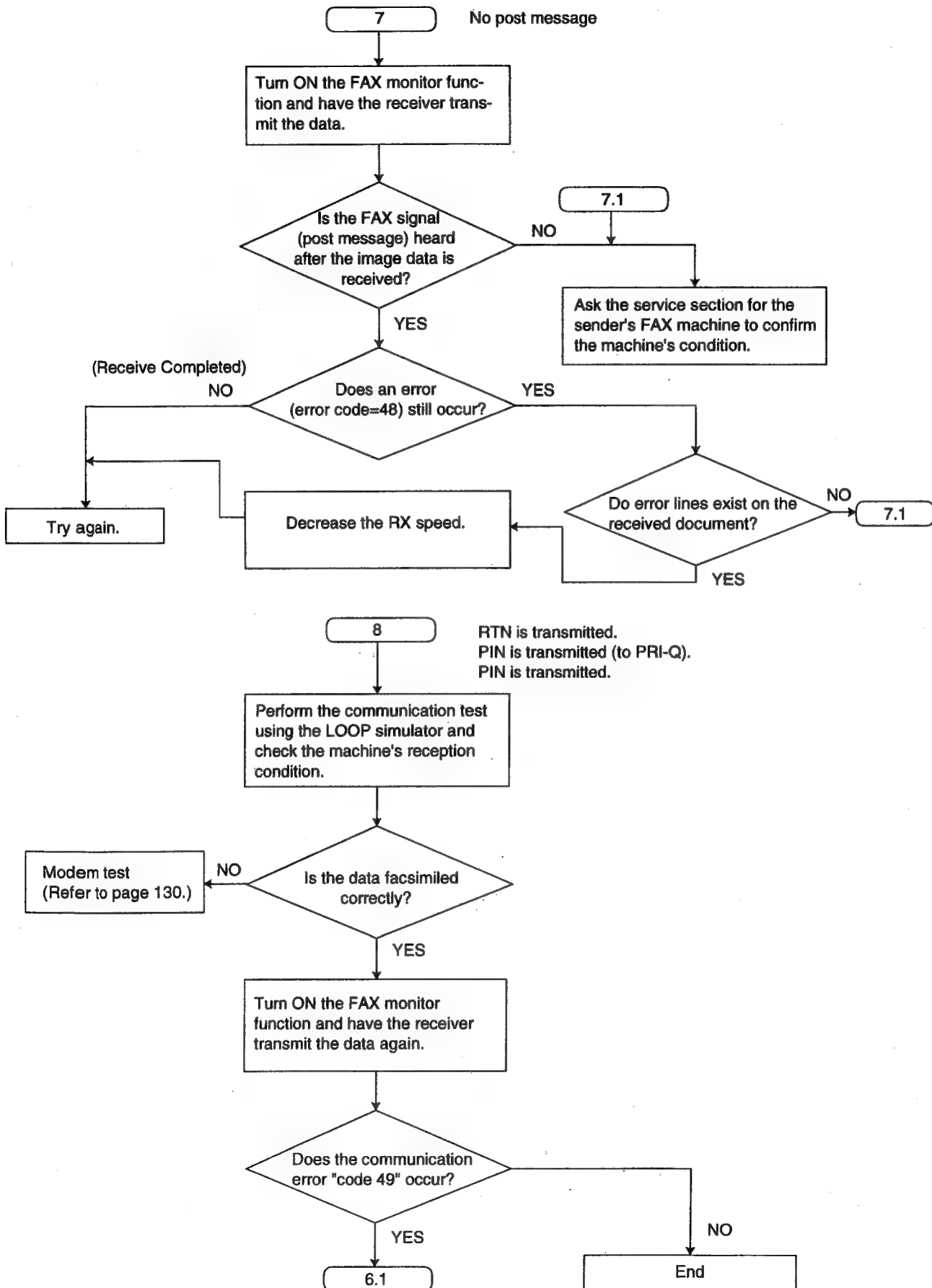
If the problem remains, see the next page.

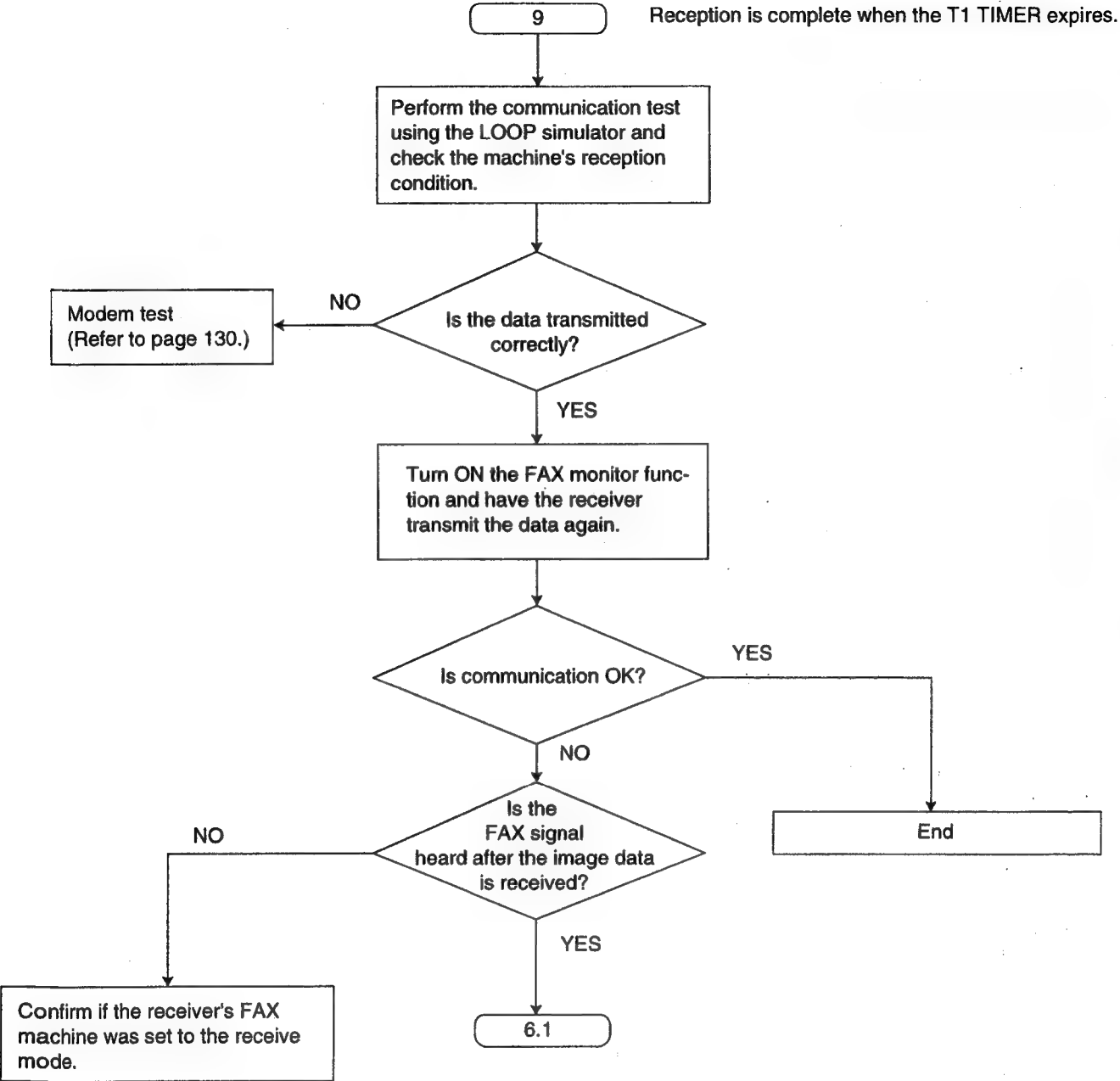
⑨ Countermeasure

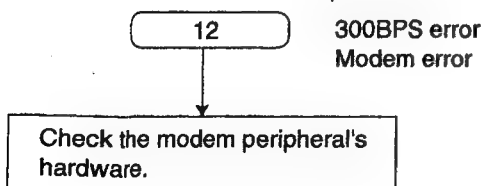
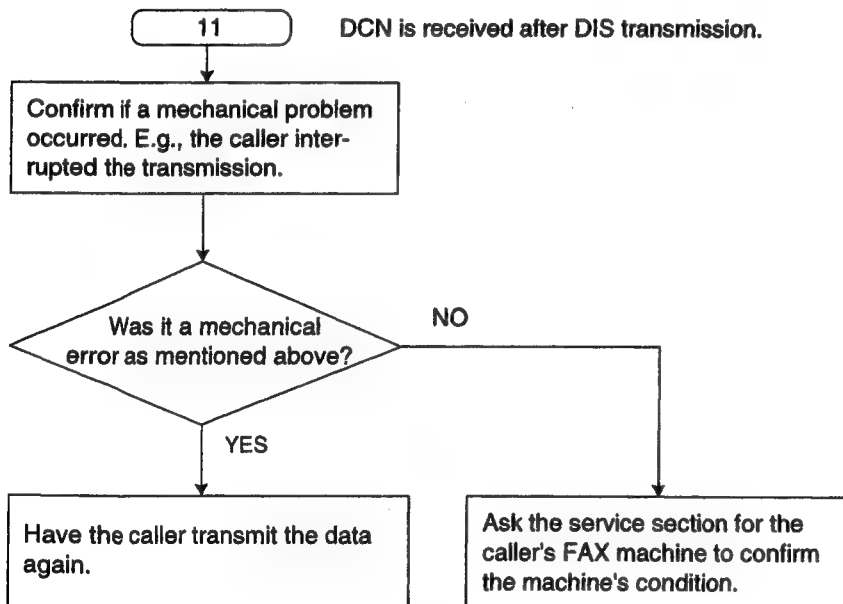
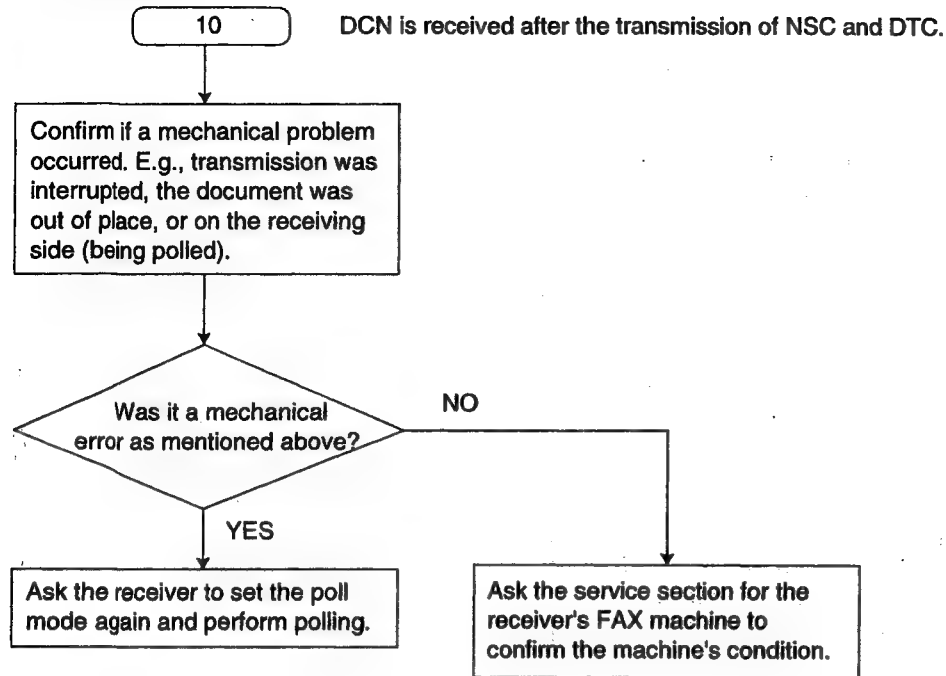


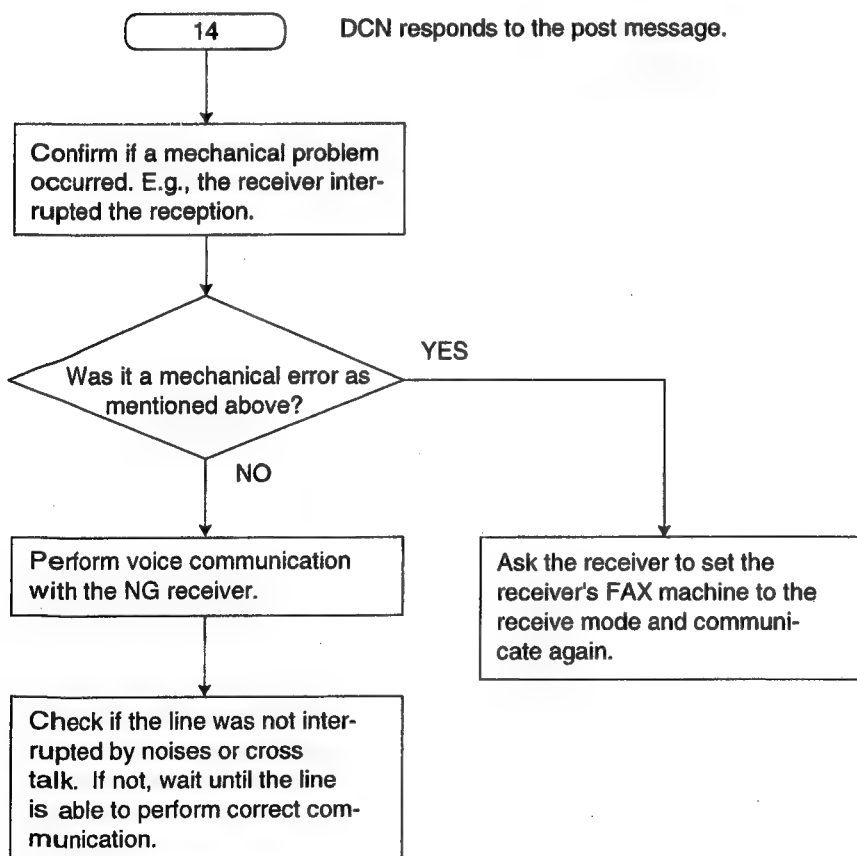
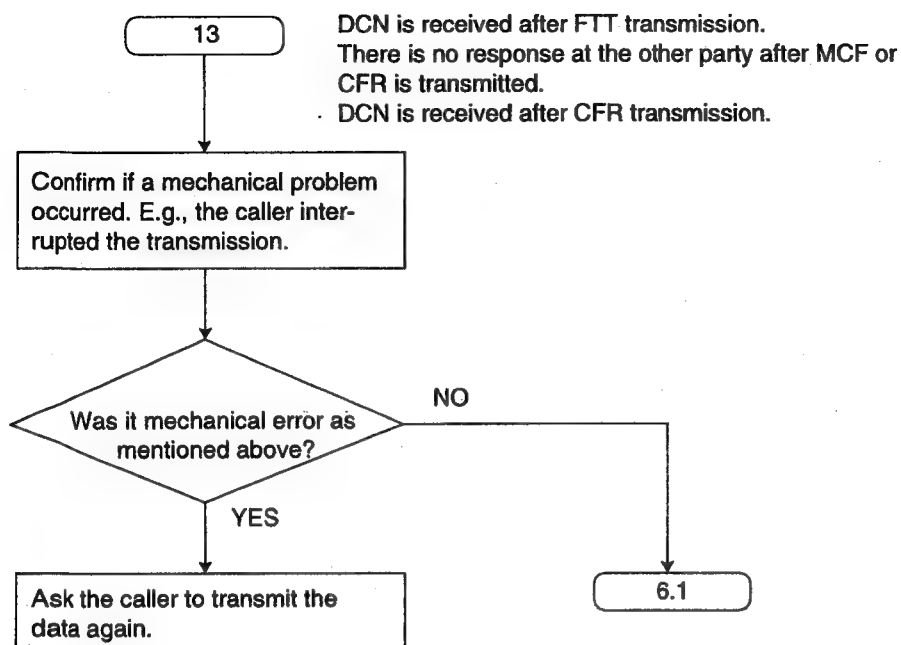


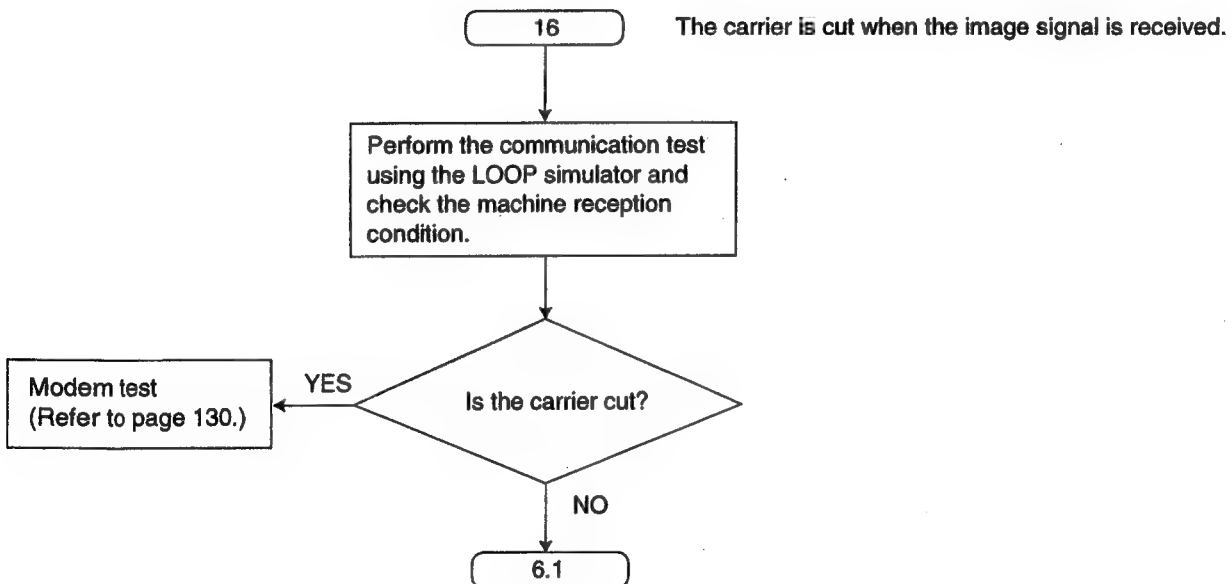
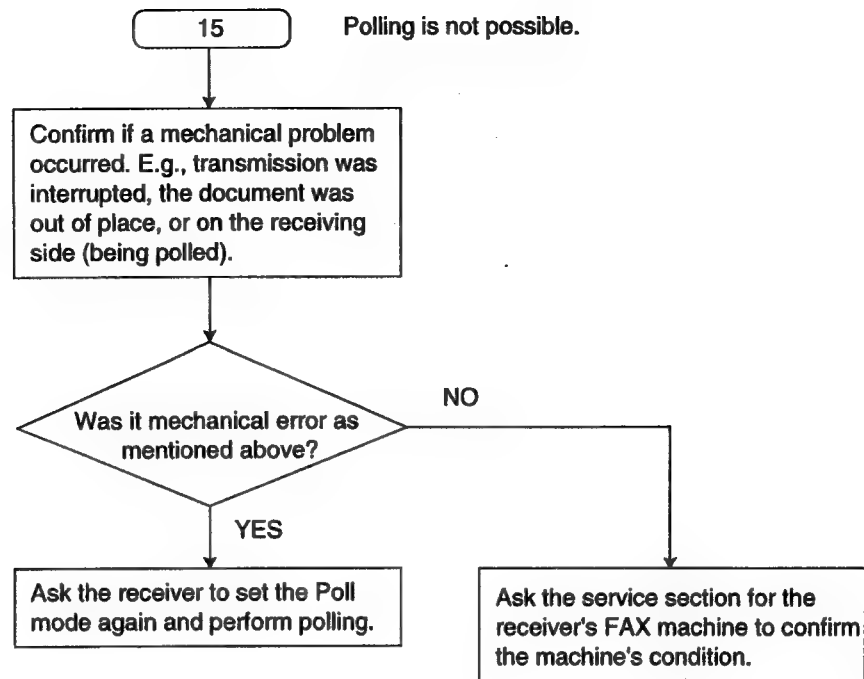






KX-FLM600G





2) Remote programming

If, after the call is connected, the customer describes the situation and it is determined that the problem can be corrected by making parameter changes, this function makes it possible to change parameters such as the user code and service code from another fax (using DTMF tones). Therefore, travel to the customer's location is not required. However, it is not possible to change all the parameters remotely (② Program mode table: refer to page 79). The function used to accomplish this is remote programming.

First, in order to check the current status of the service code parameter, out put the setup list (code: 991) and service list (code: 999) from the customer's fax machine.

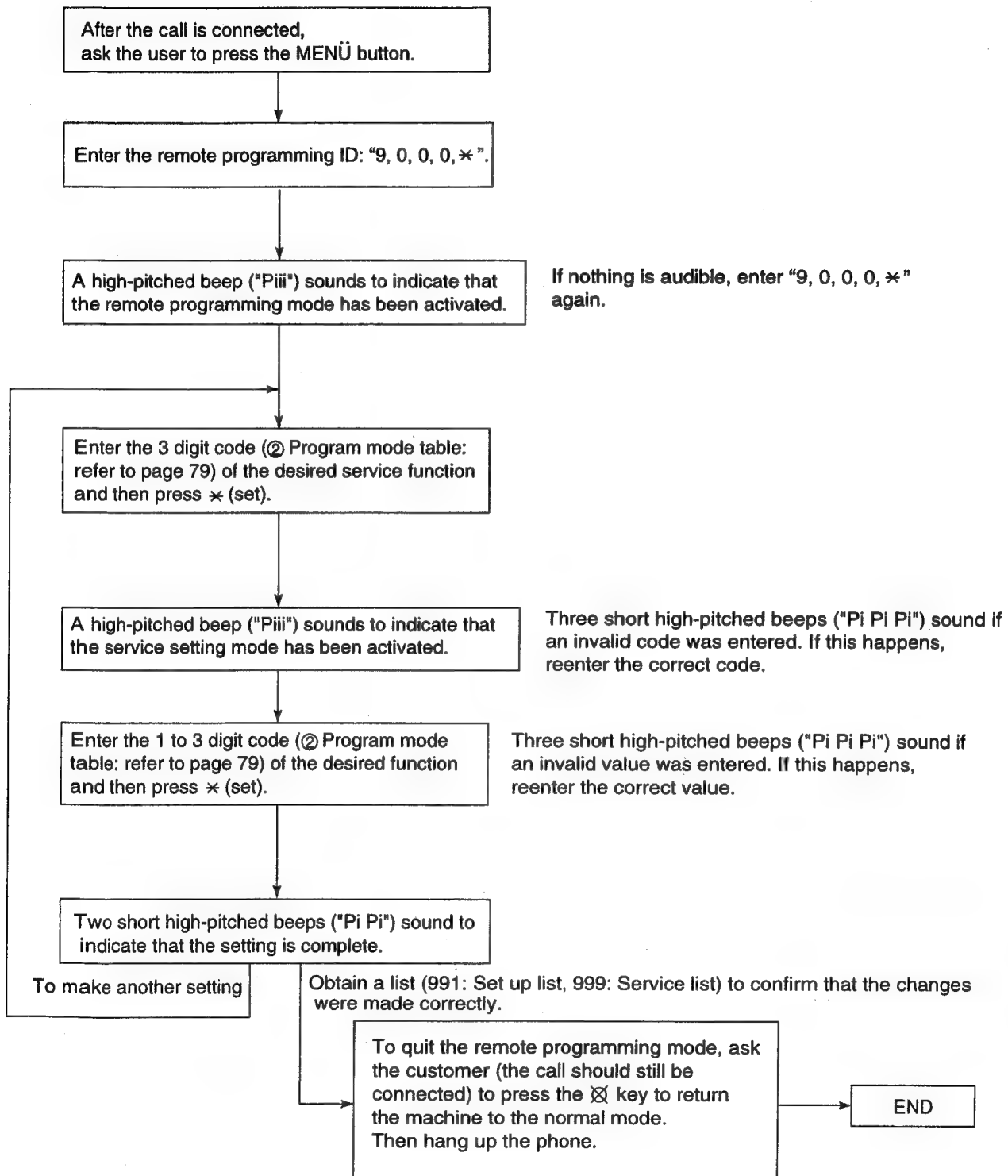
Based on this, the parameters for the desired codes can be changed.

The procedure for changing and listing parameters is described on the next page. Also, before exiting the remote programming mode, it is advisable to obtain a new list to confirm that only the desired parameters were changed.

Hint:

Since the connected telephone is in use during the remote programming mode, it may be helpful to ask the customer to switch to the speakerphone (if the unit has this feature.) This frees the customer from the need to remain right next to the fax while you are making parameter settings. When finished, inform the customer. Also note that in very noisy locations where the DTMF tones are not audible, the remote programming function will not work.

① Entering the remote programming mode and changing service codes



② Program Mode Table

Code	Function	Set Value	Default	Remote Setting
001	Set date and time	mm/dd/yy hh:mm AM/PM	Jan/01/99	NG
002	Your logo	-----	None	NG
003	Your fax number	-----	None	NG
004	Print sending report	1:Error / 2:ON / 3:OFF	Error	OK
006	FAX ring count	1~9 rings	1	OK
012	Remote TAM activation	ON / OFF	OFF / ID=11	NG
013	Dialing mode	Tone / Pulse	Tone	OK
014	PC link	1:ON / 2:OFF	ON	OK
022	Journal auto print	1:ON / 2:OFF	ON	OK
023	Overseas mode	ON / OFF	OFF	NG
025	Delayed transmission	ON / OFF	OFF	NG
030	Silent FAX recognition ring	3 to 6 rings	3	OK
037	Auto reduction	ON / OFF	ON	OK
038	Halftone mode	Photo / Auto	Auto	OK
039	LCD contrast	Normal / Darker	Normal	NG
040	Silent Detection	1:ON / 2:OFF	OFF	OK
041	FAX activation code	ON / OFF	ON / ID=*9	NG
044	Memory receive alert	1:ON / 2:OFF	ON	OK
046	Friendly reception	1:ON / 2:OFF	ON	OK
048	Sprache	Deutsch / English	Deutsch	NG
060	Express-Modus	1:ON / 2:OFF	OFF	OK
062	Telfonanschliu	1:AMT/S:NBST	AMT	OK
063	AKZ1	-----		NG
064	AKZ2	-----		NG
065	AKZ3	-----		NG
066	AKZ4	-----		NG
068	ECM selection	1:ON / 2:OFF	ON	OK
071	Rufmelodie	A, B, C	A	NG
076	Connecting tone	1:ON / 2:OFF	ON	OK
077	Auto answer mode	1: FAX only / 2:TEL/FAX	FAX only	OK
078	TEL/FAX delayed ring	1~9 rings	2	OK
079	Toner save	1:ON / 2:OFF	OFF	OK
080	Set default	Yes / No	NO	NG

KX-FLM600G

Code	Function	Set Value	Default	Remote Setting
501	Pause time set	001~600 x 100msec	030	OK
502	Flash time set	01~99 x 10msec	20	OK
503	Dial speed	1:10pps / 2:20pps	10pps	OK
511	Vox sense	1: High / 2: Low	High	OK
520	CED frequency select	1:2100Hz / 2:1100Hz	2100	OK
521	International mode select	1:ON / 2:OFF	OFF	OK
522	Auto standby select	1:ON / 2:OFF	ON	OK
523	Receive equalizer select	1:0km / 2:1.8km / 3:3.6km / 4:7.2km	0km	OK
524	Transmission equalizer select	1:0km / 2:1.8km / 3:3.6km / 4:7.2km	0km	OK
550	Memory clear	-----	-----	NG
551	ROM check	-----	-----	NG
552	DTMF signal tone test	1:ON / 2:OFF	OFF	OK
553	Monitor on FAX communication	1:OFF / 2:Phase B / 3:ALL	OFF	OK
554	Modem test	-----	-----	NG
557	LED test	-----	-----	NG
558	LCD test	-----	-----	NG
561	Key test	-----	-----	NG
563	CIS position adjustment	1~7	4	OK
570	Break % select	1:61% / 2:67%	61%	OK
571	ITS auto redial time set	00~99	05	OK
572	ITS auto redial line disconnection time set	001~999sec	065	OK
573	Remote turn-on ring number	01~99	10	OK
574	Dial Tone Detect	1:ON / 2:OFF	OFF	OK
575	OFF-HOOK alarm option	1:ON / 2:OFF	ON	OK
576	DC-Loop Detect	1:ON / 2:OFF	OFF	OK
590	FAX auto redial time set	00~99	05	OK
591	FAX auto redial line disconnection time set	001~999sec	065	OK
592	CNG transmit select	1:OFF / 2:ALL / 3:AUTO	ALL	OK
593	Time between CED and 300 bps	1:75ms / 2:500ms / 3:1sec	75ms	OK
594	Overseas DIS detection	1:1st / 2:2nd	1st	OK
595	Receive error limit value	1:5% / 2:10% / 3:15% / 4:20%	10	OK
596	Transmit level set	-15~00dBm	9	OK
598	Receiving Sensitivity	20~48	41	OK
599	ECM Memory size	1:256K byte / 2:64K byte	256K byte	OK
*605	Recall mode	1: Flash / 2: Earth Recall	Flash	OK
624	AT ring time out	1: 3 sec / 2: 5 sec	3 sec	OK
630	Time of power save starting	1~30min	5min	OK

* 605: Used only when the option is in use.

Code	Function	Set Value	Default	Remote Setting
700	ETX. TAM OGM Rec. time	01~99sec	16 sec	OK
701	No voice detect time	01~99	40x100msec	OK
717	Transmit speed select	1:14400/ 2:12000/ 3:9600/ 4:7200/ 5:4800/ 6:2400	14400bps	OK
718	Receive speed select	1:14400/ 2:12000/ 3:9600/ 4:7200/ 5:4800/ 6:2400	14400bps	OK
719	Ringer off in TEL/FAX mode	1:ON / 2:OFF	ON	OK
721	Pause tone detect	1:ON / 2:OFF	ON	OK
722	Redial tone detect	1:ON / 2:OFF	ON	OK
724	Busy tone detection for PC fax transmission	1:ON / 2:OFF	ON	OK
732	Auto disconnect	1:350ms / 2:1800ms / 3:OFF	350msec	OK
763	CNG detect time for friendly reception	1:10s / 2:20s / 3:30s	30s	OK
771	T1 timer	1:35s / 2:60s	35s	OK
788	Shading and detecting white peak level	-----	-----	NG
815	Sensor & VOX test	-----	-----	NG
852	Print test pattern	-----	-----	NG
853	Top margin	1~5	-----	OK
854	Left margin	1~3	-----	OK
861	A4 size set	1:ON / 2:OFF	ON	
880	History list	1:Start	-----	NG
881	Journal 2 list	1:Start	-----	OK
882	Journal 3 list	1:Start	-----	OK
890	TEL/FAX ring back tone	1:ON / 2:OFF	ON	OK

3.10 ELECTRICAL SECTION**3.10.1 Digital Board Section**

When the unit fails to boot up the system, take the troubleshooting procedures very carefully. It may have a serious problem.

The symptom: No response when the power is turned on. (No LCD display, and keys are not accepted.)

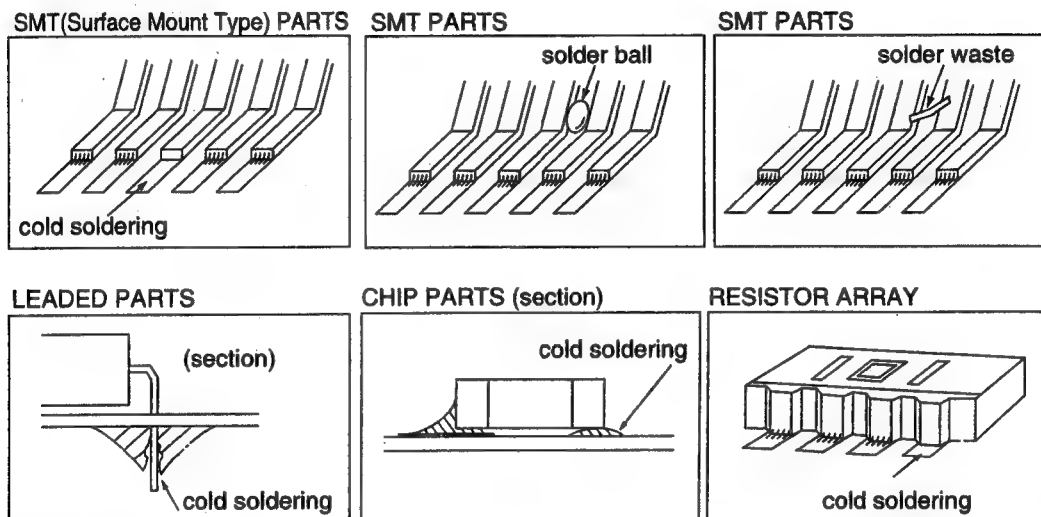
The first step is to check the power source. If there is no problem with the power supply unit, the problem may lie in the digital unit (main board).

As there are many potential causes in this case (ASIC, DRAM, etc.), it may be difficult to specify what you should check first.

If a mistake is made in the order of checks, a normal part may be determined faulty, wasting both time and money.

Although the tendency is to regard the problem as a serious one (IC malfunction, etc.), usually most cases are caused by solder faults (poor contact due to a tunnel in the solder, signal short circuit due to solder waste).

Note:



1. Electrical continuity may have existed at the factory check, but a faulty contact occurred as a result of vibration, etc., during transport.

2. Solder waste remaining on the board may get caught under the IC during transport, causing a short circuit.

Before we begin mass production, several hundred trial units are produced at the plant, various tests are applied and any malfunctions are analyzed. (In past experiences, digital IC (especially SRAM, DRAM and ROM) malfunctions are extremely rare after installation in the product.)

This may be repaired by replacing the IC, (DRAM etc.). However, the real cause may not have been an IC malfunction but a soldering fault instead.

Soldering faults difficult to detect with the naked eye are common, particularly for ASIC and RA (Resistor Array). But if you have an oscilloscope, you can easily determine the problem site or IC malfunction by checking the main signal lines.

Even if you don't have such a measuring instrument, by checking each main signal line and resoldering it, in many cases the problem will be resolved.

An explanation of the main signals (for booting up the unit) is presented below.

Don't replace ICs or stop repairing until checking the signal lines.

An IC malfunction rarely occurs. (By understanding the necessary signals for booting up the unit, the "Not Boot up" display is not a serious problem.)

What are the main signals for booting up the unit?

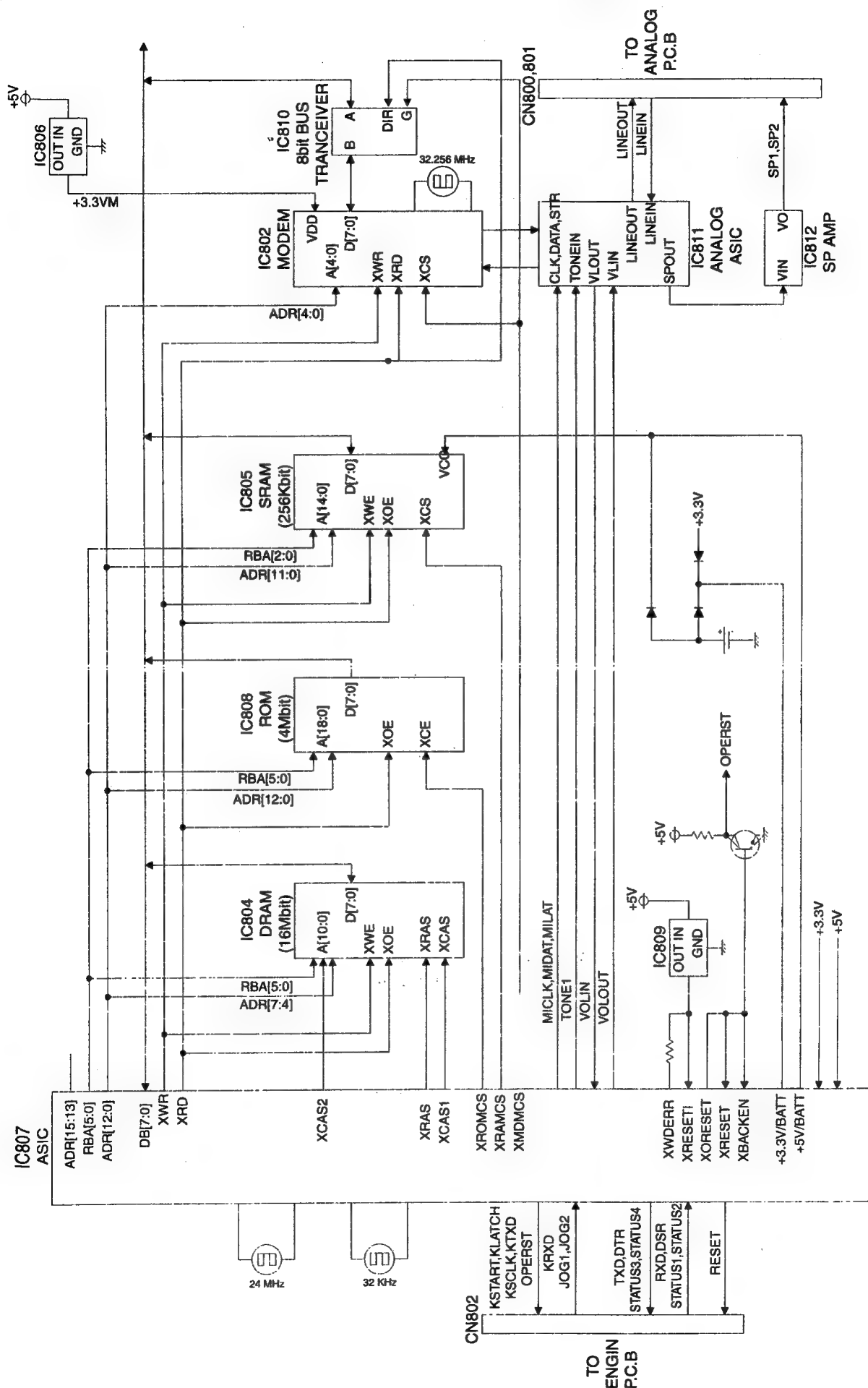
Please refer to **Digital Block Diagram**. (Next page)

The ASIC (IC807) controls all the other digital ICs. When the power is turned on, the ASIC retrieves the operation code stored in the ROM (IC808), then follows the instructions for controlling each IC. All ICs have some inner registers that are assigned to a certain address.

It is the address bus by which the ASIC designates the location inside each IC. And the data bus reads or writes the data in order to transmit the instructions from the ASIC to the ICs.

These signal lines are all controlled by voltages of 5V (H) or 0V (L).

DIGITAL BLOCK DIAGRAM



The signal lines that must be normal for the system to boot up are listed here [List 1].

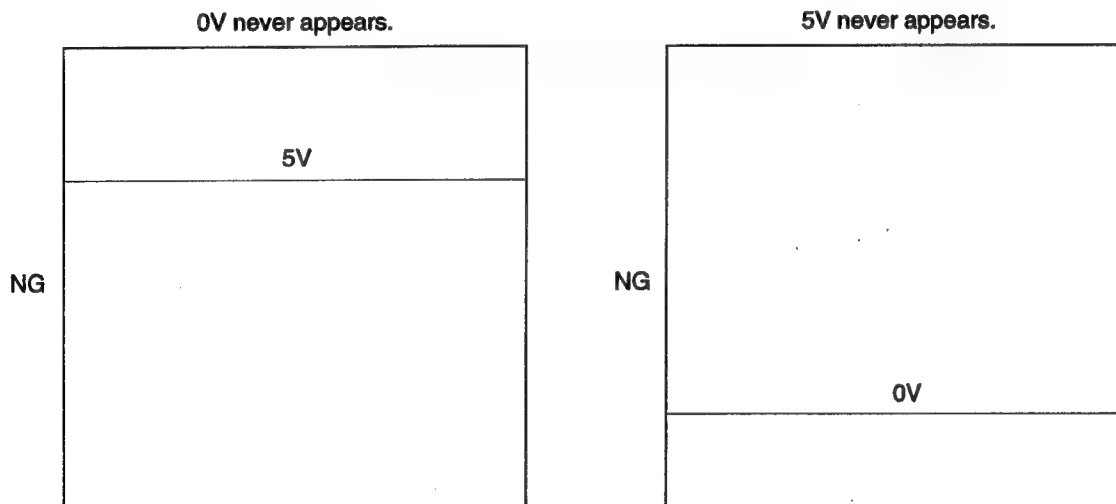
For signal lines other than these, even if they malfunction, they do not directly affect booting up the system.

[List 1]

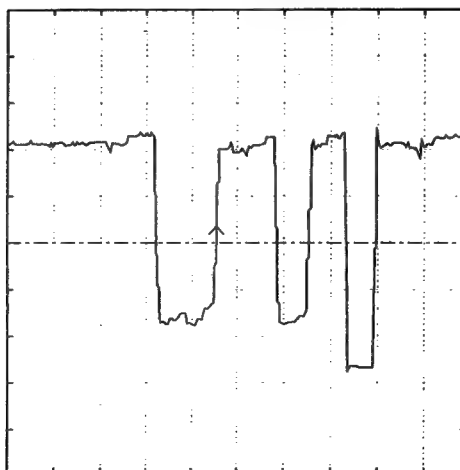
① D0~D7	(Data Bus)
① A0~A15	(Address Bus)
② \overline{RD}	(Read Signal)
\overline{ROMCS}	(ROM Select Signal)
\overline{WR}	(Write Signal)
\overline{RAMCS}	(SRAM Select Signal)
④ RBA0~RBA5	(Bank Address Signal)
⑤ \overline{RAS}	(DRAM Row Address Strobe Signal)
$\overline{CAS1}, \overline{CAS2}$	(DRAM Column Address Strobe Signal)
⑥ \overline{MDMCS}	(Modem Select Signal)

If these signals are in the normal condition, once the power is turned on, each IC repeatedly output 5V (H) and 0V (L). The following page shows NG and normal wave patterns.

NG Wave pattern (Refer to NG EXAMPLE)

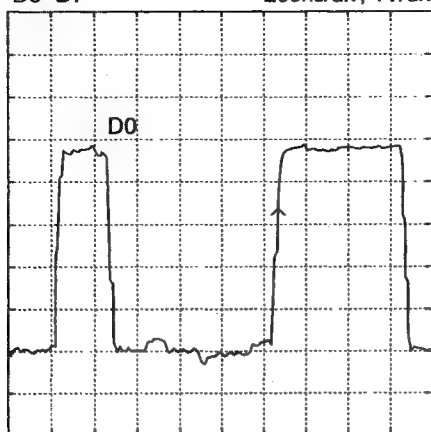


Short between D0 and D1
500ns/div, 1V/div

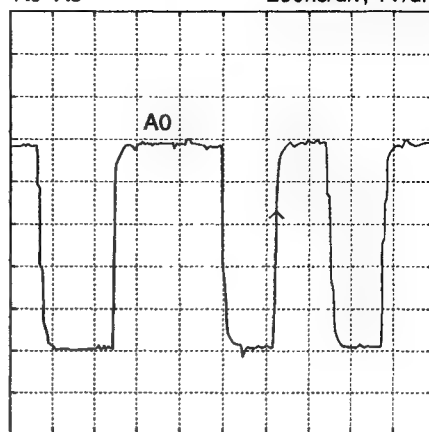
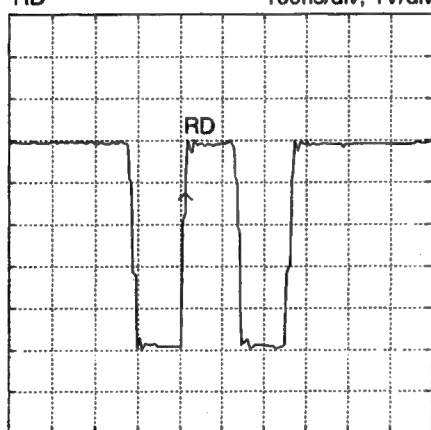


Normal Wave Patterns

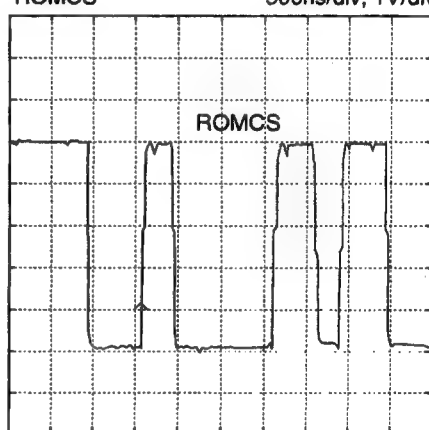
① D0~D7 200ns/div, 1V/div



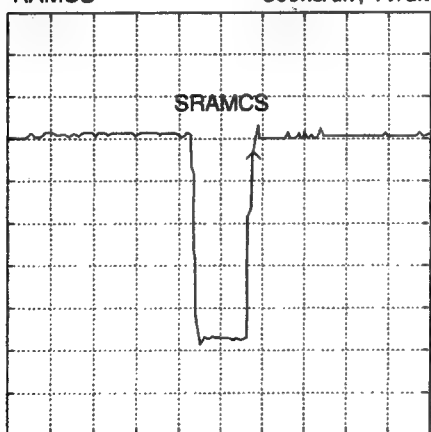
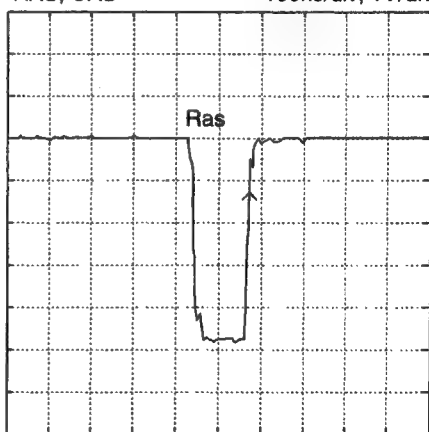
② A0~A5 200ns/div, 1V/div

③ \overline{RD} 100ns/div, 1V/div

④ ROMCS 500ns/div, 1V/div



⑤ RAMCS 500ns/div, 1V/div

⑥ \overline{RAS} , \overline{CAS} 100ns/div, 1V/div**Remarks:**

For these reasons and the software sequence to boot up the unit, if you use an oscilloscope to judge whether a signal is OK or NG, you must check in the same order as in [List 1]. (If the ASIC failed to access the ROM, the ASIC cannot access SRAM or DRAM normally.)

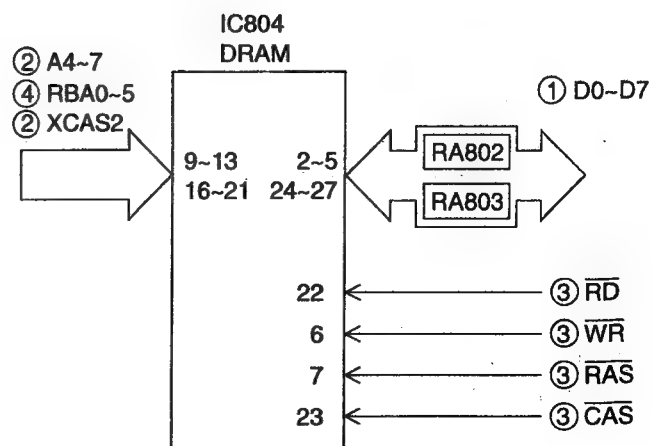
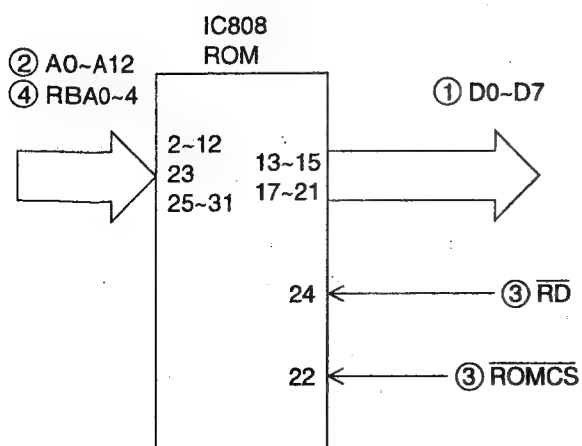
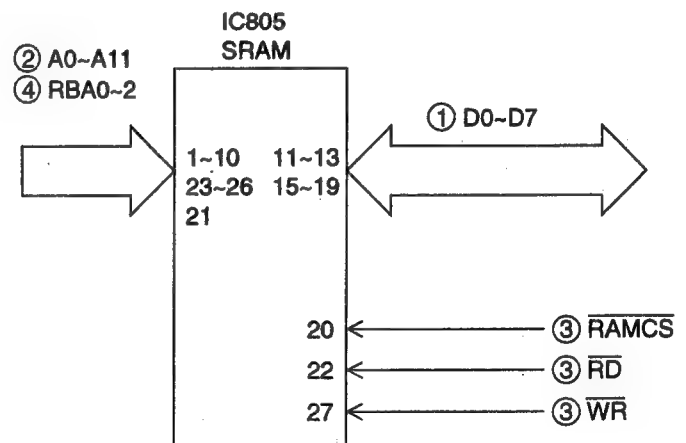
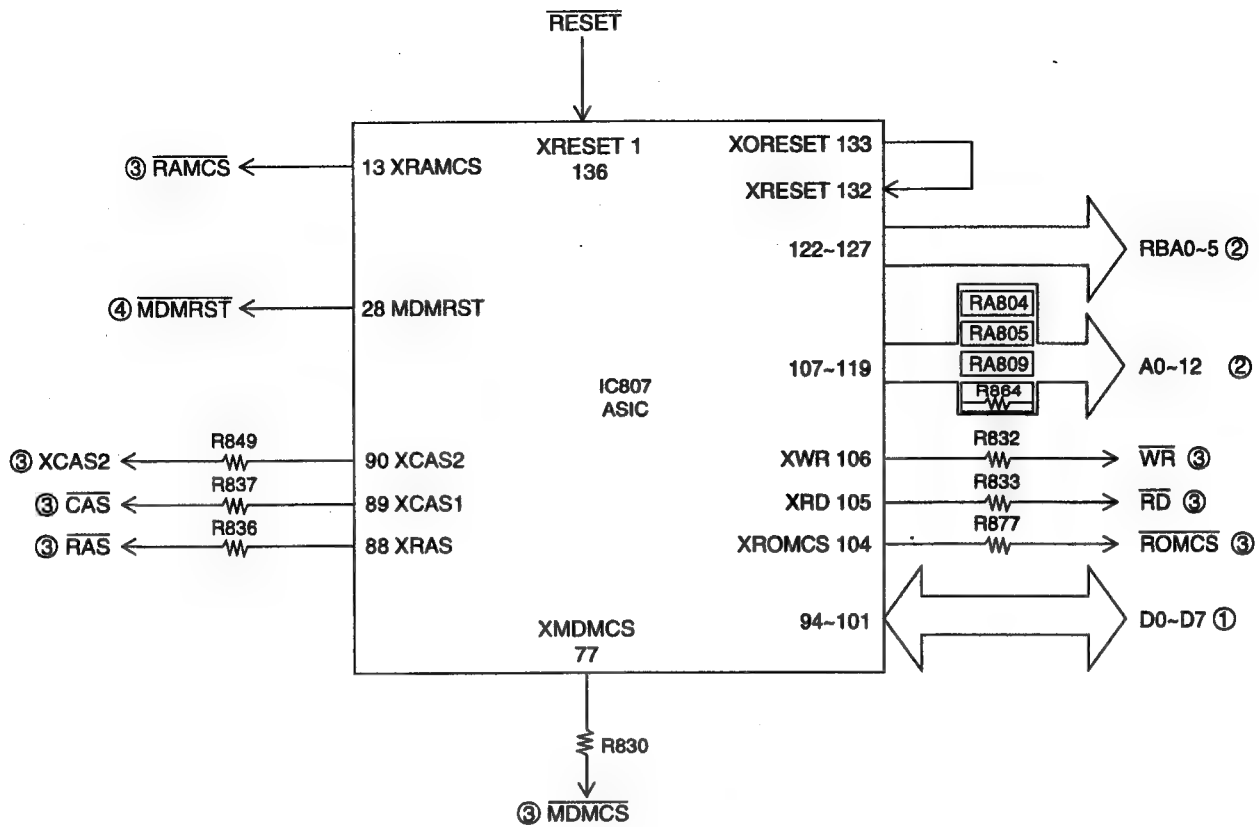
The digital circuit actually operates according to the timing combinations of these signals. So, if the timing of these signals is even slightly off, the circuit will not operate normally. Even if the IC did malfunction, the output voltage level may become abnormal but the timing is accurate according to the specifications. (If oscillation is provided accurately.)

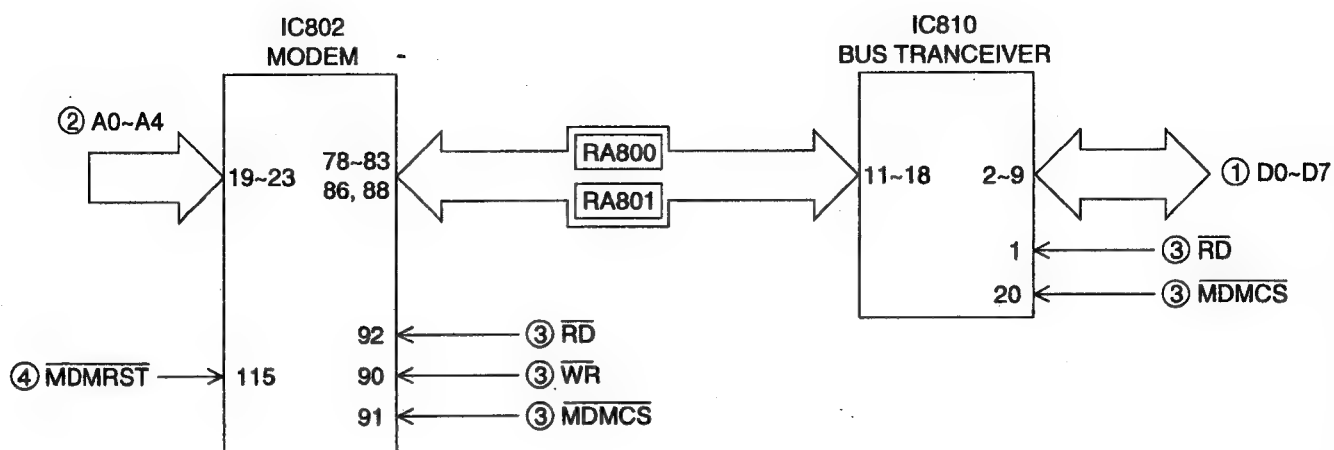
Accordingly, the problem presented here is whether each IC outputs the correct signal. (See the I/O direction diagram on the next page.) In other words, is it constantly switching between 5V (H) and 0V (L) as described earlier.

Note:

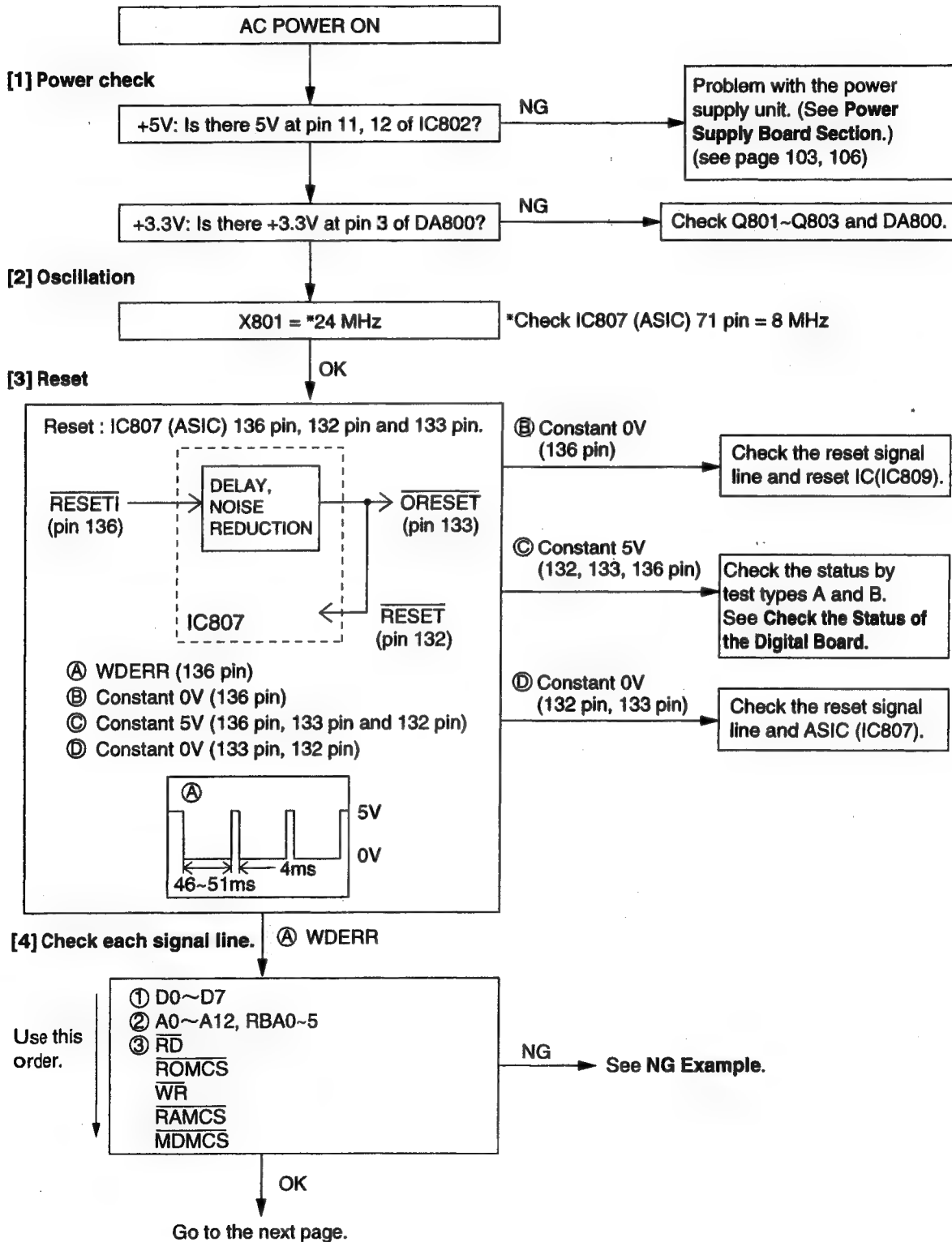
All you have to do is check that the IC repeatedly outputs (H) 5V and (L) 0V.

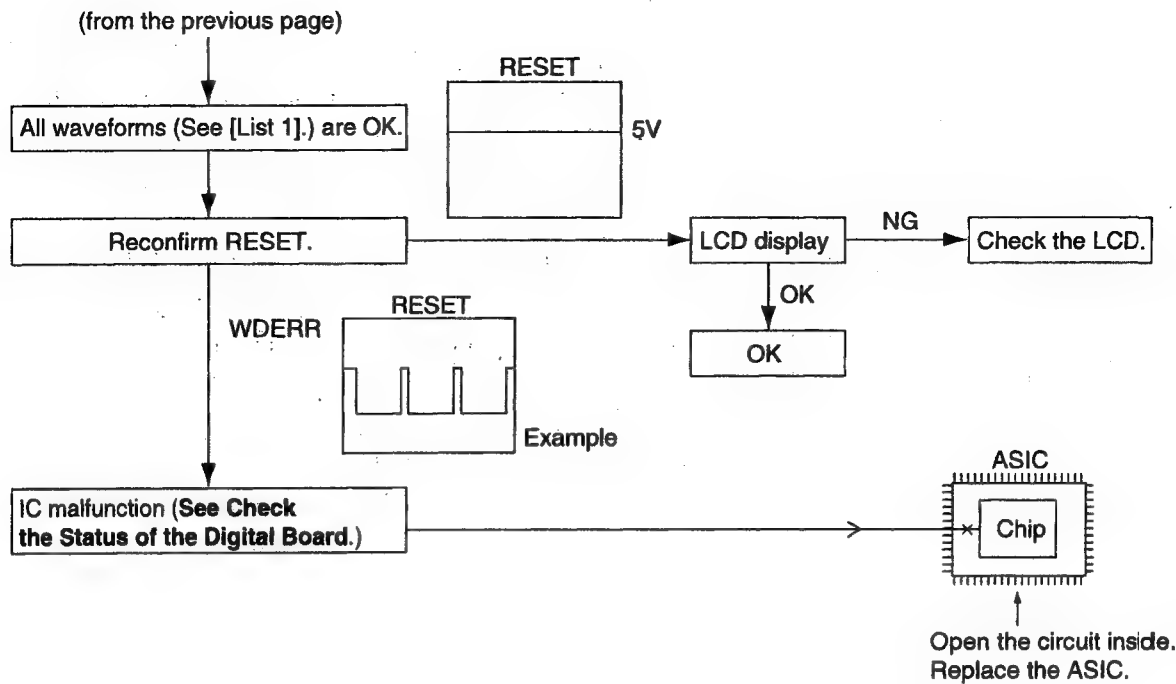
I/O and Pin No. Diagram





After the power is turned on, the ASIC initializes and checks each IC.
The ROM, SRAM, and modem are checked.
If initialization fails for the ICs, the system will not boot up.
In this case, please find the cause as follows.





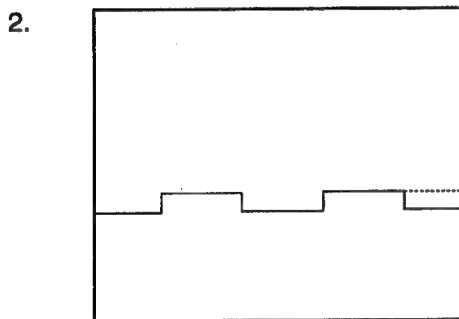
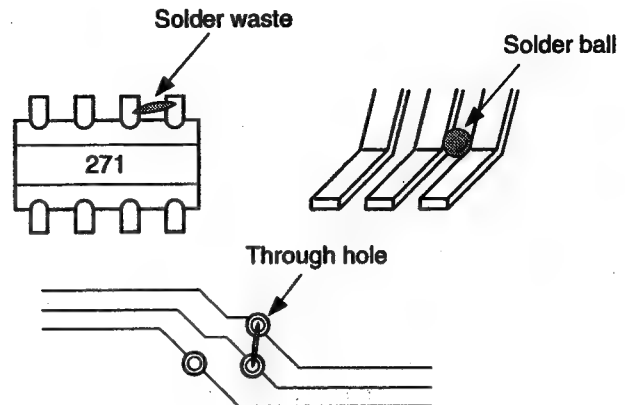
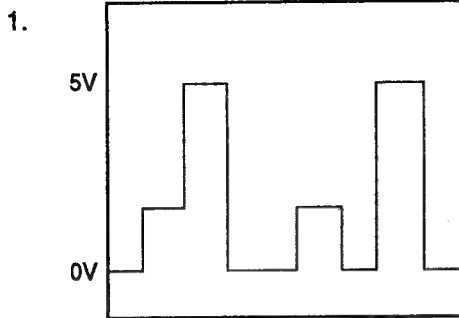
TROUBLESHOOTING GUIDE

Other NG examples while the power is ON and the LCD displays the following.

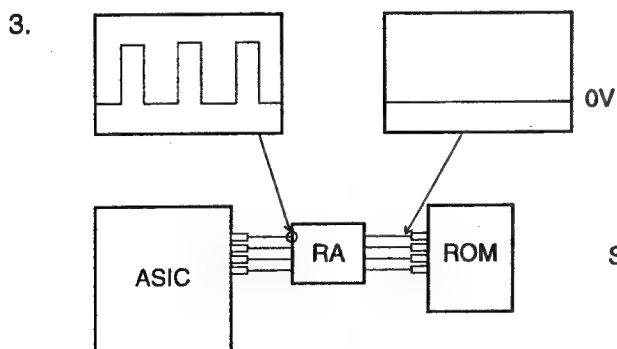
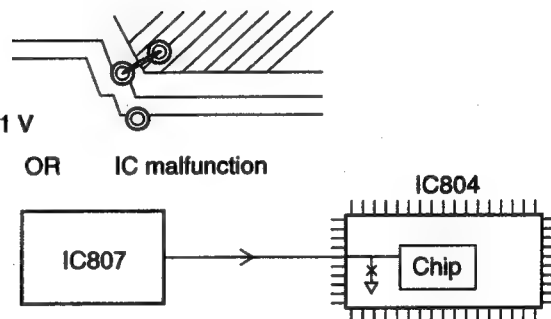


NG Example

Short circuit from the adjacent signal wires.
Check for a short circuit in the RA and IC leads and the signal wire at the through hole.

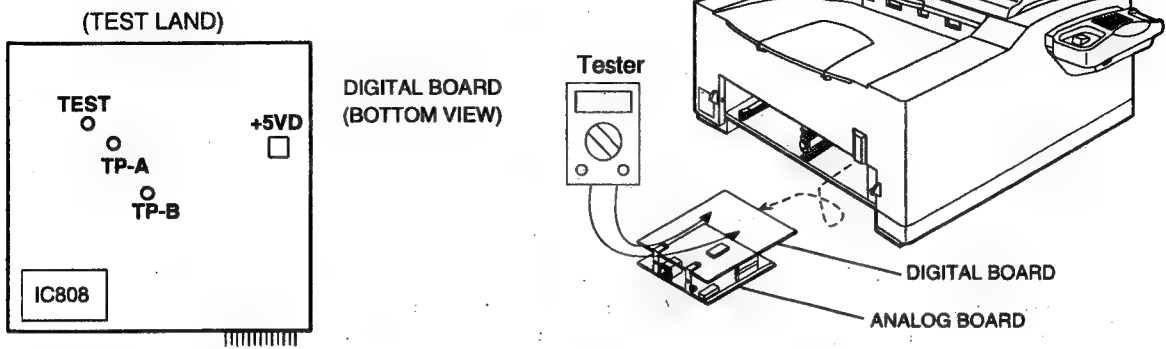


Short between the signal line and GND.



Solder fault on RA.

Please check the status (voltage) of test lands **TP-A** and **TP-B**.
The result may tell you a defective point.



- Turn off the power supply.
- Short using a metallic object, such as tweezers, between the **TEST** point and **+5V** land, and turn on the AC power for a few seconds. And then remove a metallic object.
- Check the following voltages using an oscilloscope or tester.
- To cancel the status check mode, turn off the AC power.

Defective point	Check point voltage		Check items
	TP-A	TP-B	
RTC (IC807)	0V	0V	IC807(RTC is included in IC807)
DRAM (IC804)	0V	5V	IC804(7,23 pin), R836, R837, R841, IC807(88, 89 pin)
MODEM (IC802)	5V	0V	IC807(77 pin), IC802(90~92 pin), R830, R812, RA800, RA801, IC810(1, 19 pin), L805, X800
ALL OK	5V	5V	

• This indicates that the Add/Data Bus, RAM, ROM, MODEM, and ASIC are all connected to the ASIC properly and that control from the ASIC is possible.

Please check the soldering and conduction of these components.
If there is no problem, replace the ICs.

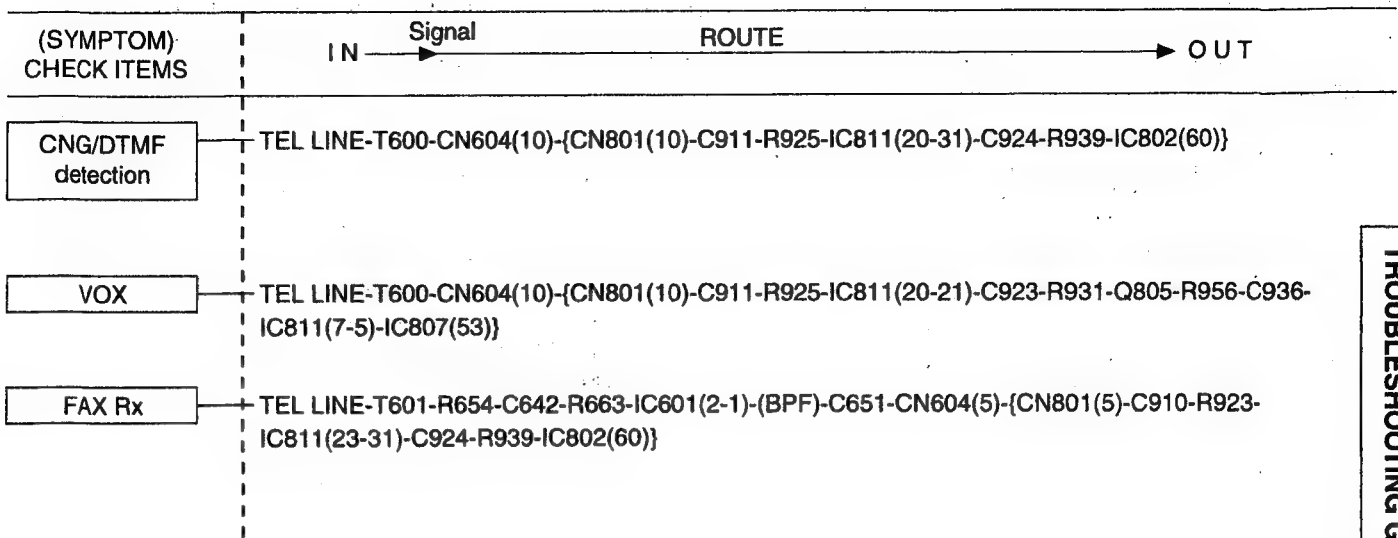
If you still have a problem with the digital board, please refer to **NG wave pattern**. (See page 85.)

310.2 Analog Board Section

The analog parts check is actually different than the digital parts check. The signal route is determined by the purpose of the check. For example, the handset TX route begins from the handset microphone and is output in the telephone line. In this route, it is mainly an analog signal. Tracing the signal can be done easily using an oscilloscope. Each route is shown on the Check Sheet here. If there is a problem with the unit (for example, you cannot communicate with the H/S, etc.), trace the signal in the area and determine the cause.

CHECK SHEET

(SYMPTOM) CHECK ITEMS		IN → Signal ROUTE → OUT
MONITOR		TEL LINE-T601-R654-C642-R663-IC601(2-1)-(BPF)-C651-CN604(5)-(CN801(5)-C910-R923-IC811(23-34)-C904-R954-IC807(42-41)-C914-R922-IC811(32-35)-C930-R942 IC812(4-5)-L809-CN801(17))-CN604(17)-L613-CN603(7) SPEAKER IC812(4-8)-L808-CN801(18))-CN604(18)-L614-CN603(8)
HANDSET Tx		HS MIC-CN603(4)-L608-C637-R645-IC603(2-1)-C701-R711-CN604(12)-(CN801(12)-IC811(15-22)-CN603(2)-L606-C650-R661-IC603(3-1)) CN801(7))-CN604(7)-C638-R714-R647-IC601(6-7)-C633-R642-R641-T601-TEL LINE
HANDSET Rx		TEL LINE-T601-C654-C642-R663-IC601(2-1)-(BPF)-C651-CN604(5)-(CN801(5)-C910-R923-IC811(23-34)-C904-R954-IC807(42-41)-C914-R922-IC811(32-11)-CN801(13))-CN604(13)-R674-C664-IC602(3-4)-C665-R675-IC603(6-7)-C668-R677-Q612-C658-L605-CN603(1)-HANDSET SPEAKER
DTMF Monitor	Speaker	{IC802(69)-R938-C922-IC811(24-35)-C930-R942 IC812(4-5)-L809-CN801(17))-CN604(17)-L613-CN603(7) SPEAKER IC812(4-8)-L808-CN801(18))-CN604(18)-L614-CN603(8)}
	Handset	{IC802(69)-R938-C922-IC811(24-11)-CN801(13))-CN604(13)-R674-C664-IC602(3-4)-C665-R675-IC603(6-7)-C668-R677-Q612-C658-L605-CN603(1)-HANDSET SPEAKER
DTMF for TEL Line FAX Tx		{IC802(69)-R938-C922-IC811(24-22)-CN801(7))-CN604(7)-C638-R714-R647-IC601(6-7)-C633-R642-R641-T601-TEL LINE
Dummy Ring Back tone		{IC807(38)-C909-R920-IC811(27-22)-CN801(7))-CN604(7)-C638-R714-R647-IC601(6-7)-C633-R642-R641-T601-TEL LINE
Ringin/ Alarm/Beep/ Key tones		{IC807(38)-C909-R920-IC811(27-35)-C930-R942 IC812(4-5)-L809-CN801(17))-CN604(17)-L613-CN603(7) SPEAKER IC812(4-8)-L808-CN801(18))-CN604(18)-L614-CN603(8)}



TROUBLESHOOTING GUIDE

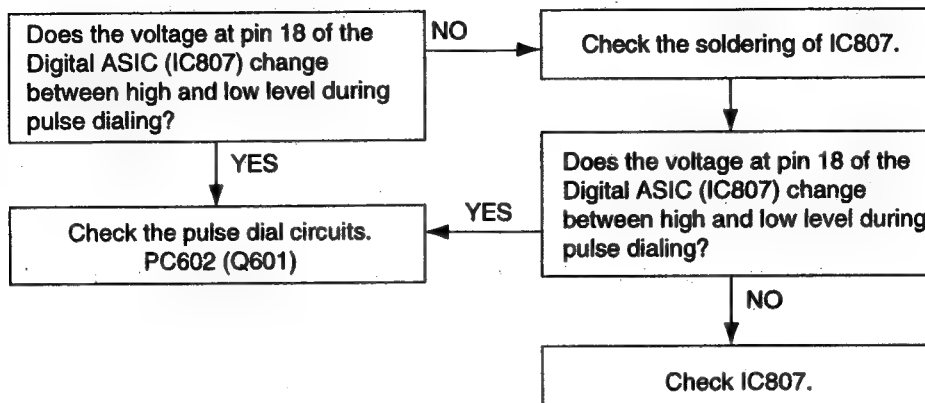
Note:
{ }: Inside the digital board

KX-FLM600G

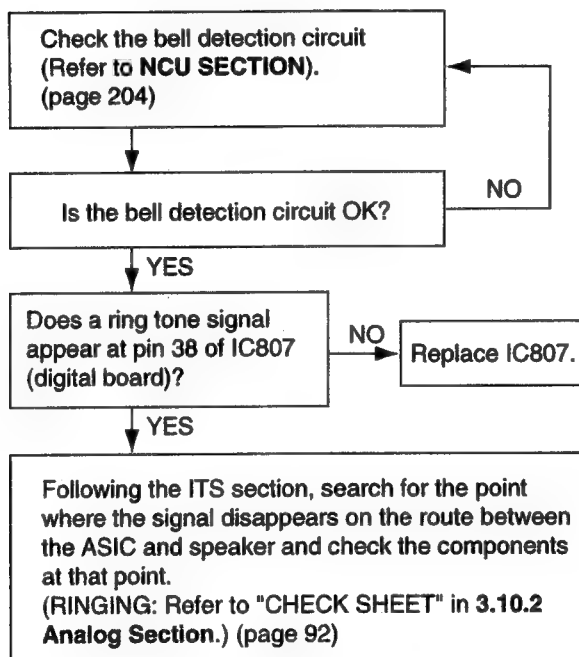
a. No handset and speakerphone transmission / reception

Perform a signal test in the ITS or the NCU section and locate a defective point (where the signal disappears) on each route between the handset microphone and telephone line (sending), or between the telephone line and the handset speaker (receiving), or between the microphone and the telephone line (sending), or between the telephone line and the speaker (receiving). Check the components at that point. "CHECK SHEET" in 3.10.2 Analog Board Section is useful for this investigation.

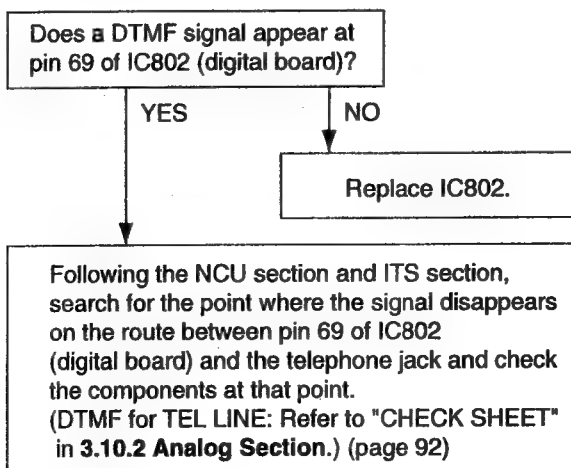
b. No pulse dialing



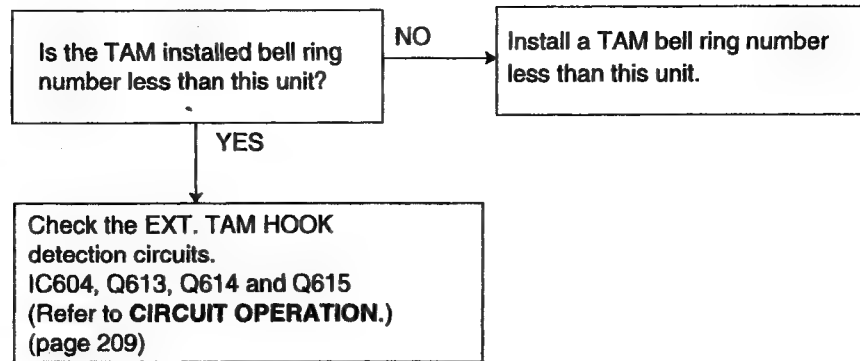
c. No ring tone (or No bell)



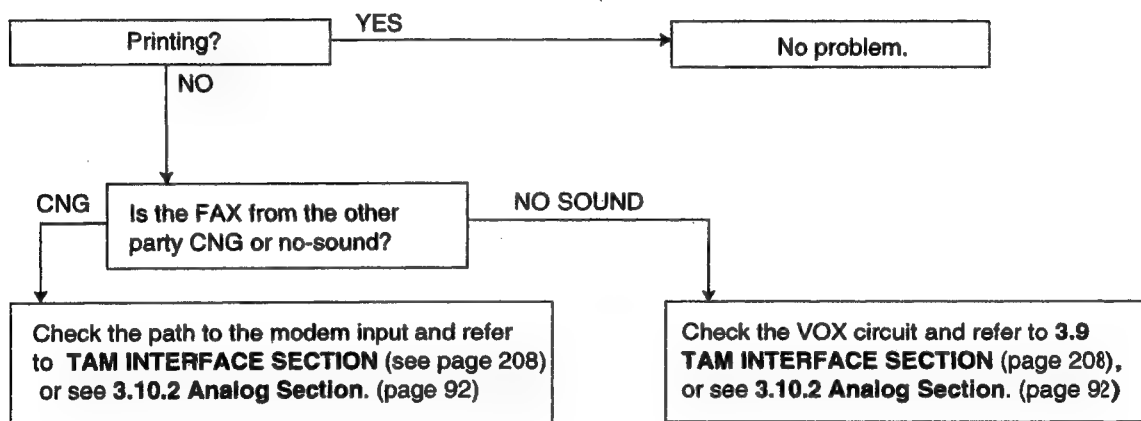
d. No tone dialing



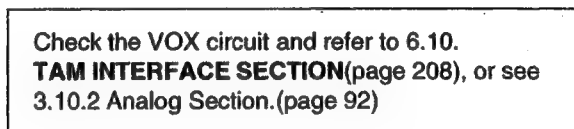
a. The FAX turns on, but does not arrive through TAM.



b. A FAX is received, but won't switch from TAM to FAX.

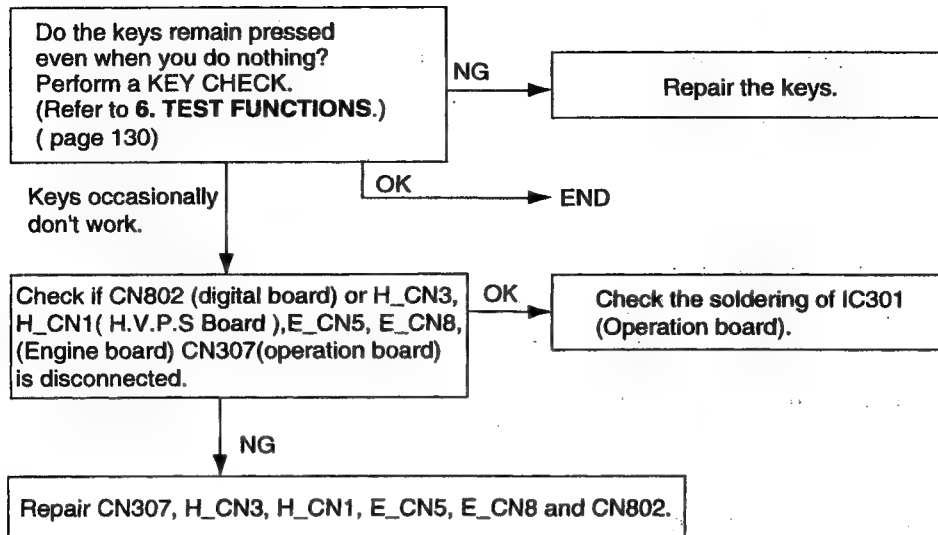


c. A voice is coming in but the unit switches to the FAX.

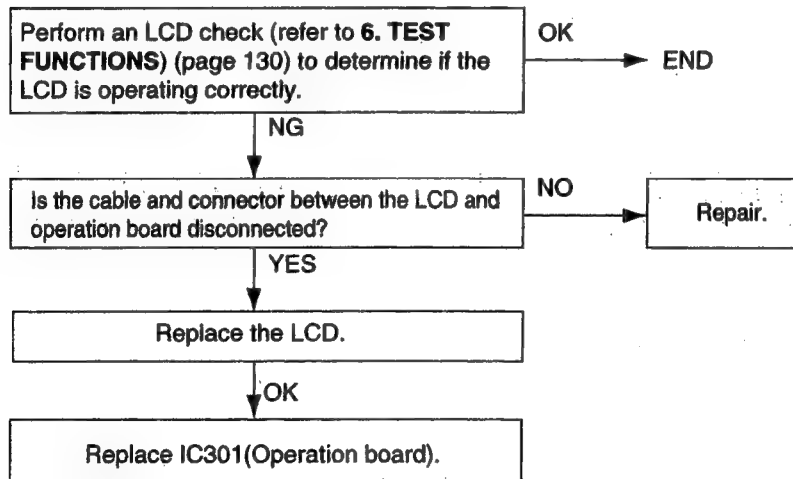


3.10.3 Operation Panel Section

1. No key operation



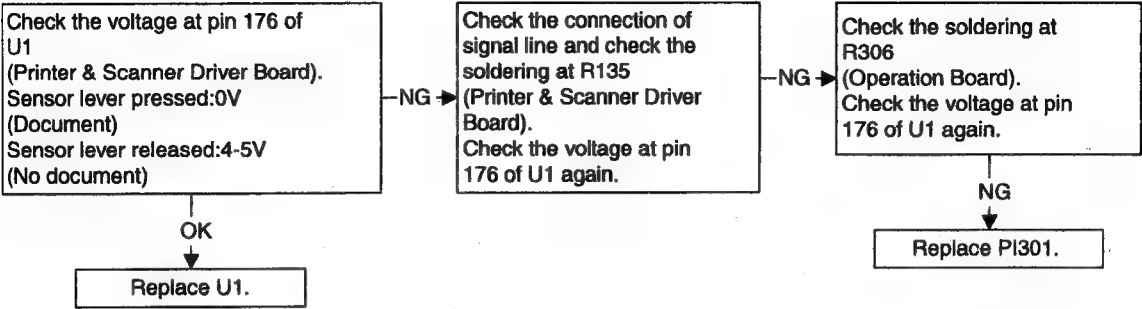
2. No LCD indication



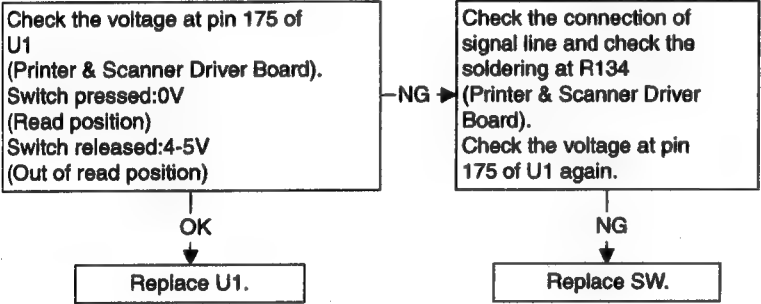
3.10.4 SENSOR SECTION(Refer to SENSORS AND SWITCHES for the circuit descriptions.)

Perform an SENSOR CHECK to determine if the sensor is operating correctly.

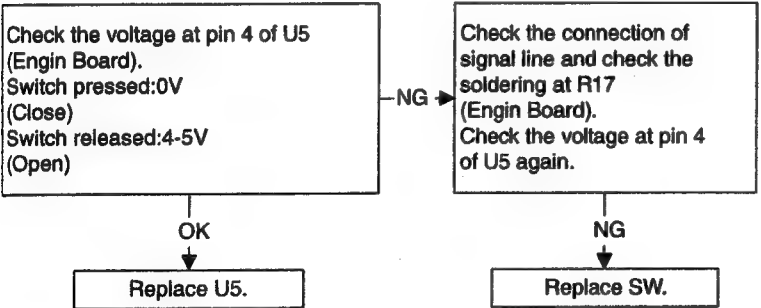
1) Check the document sensor....."CHECK DOCUMENT"



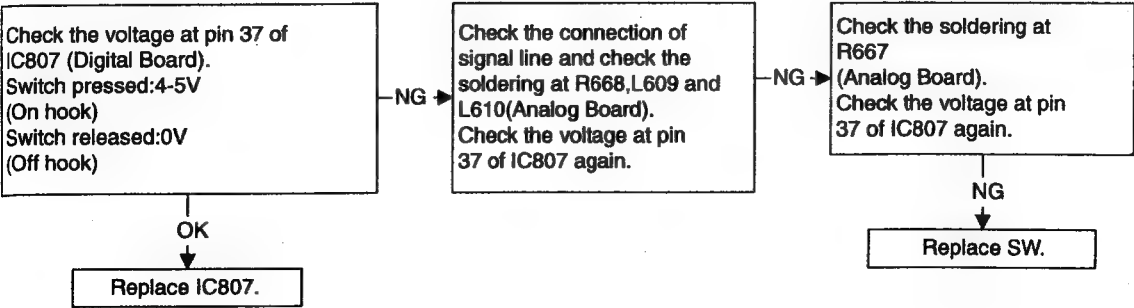
2) Check the paper feed switch....."REMOVE DOCUMENT"



3) Check the scanner cover open sensor....."PANEL OPEN"

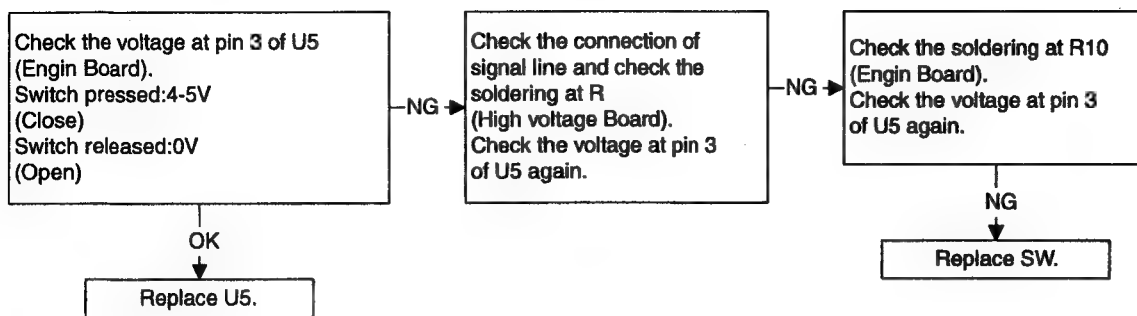


4) Check the hook switch

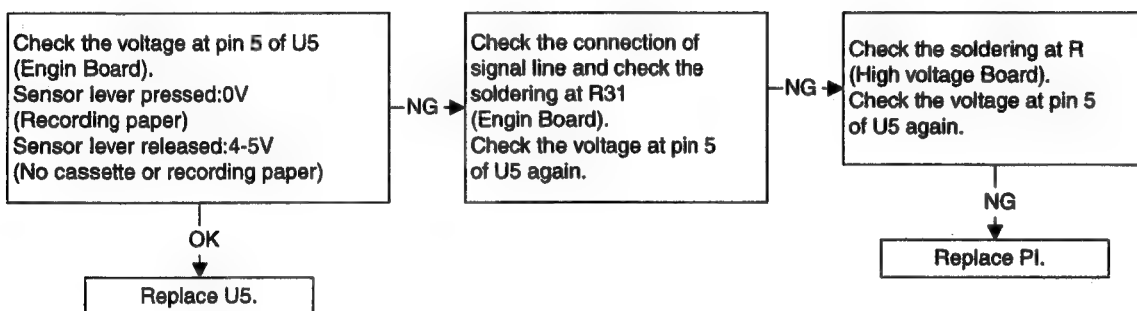


KX-FLM600G

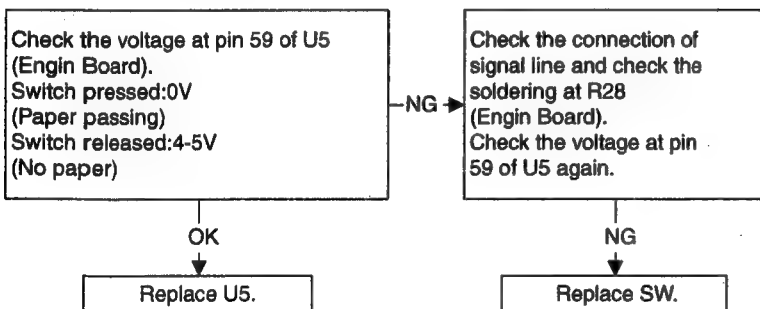
5) Check the printer cover open sensor....."TOP COVER OPEN"



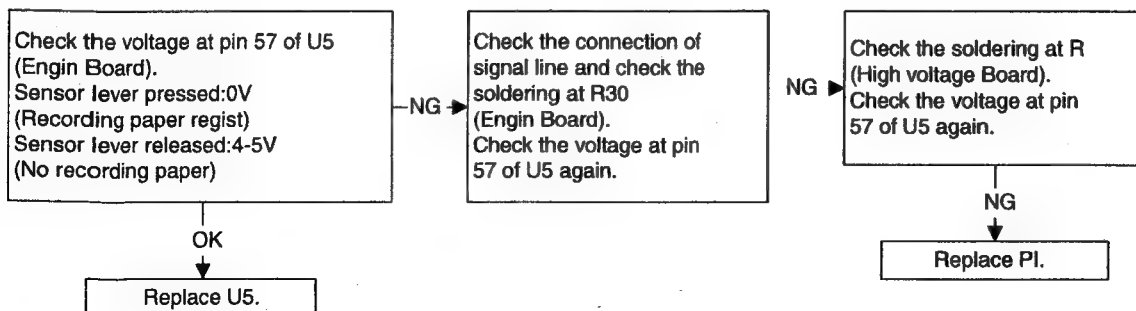
6) Check the paper sensor....."OUT OF PAPER"



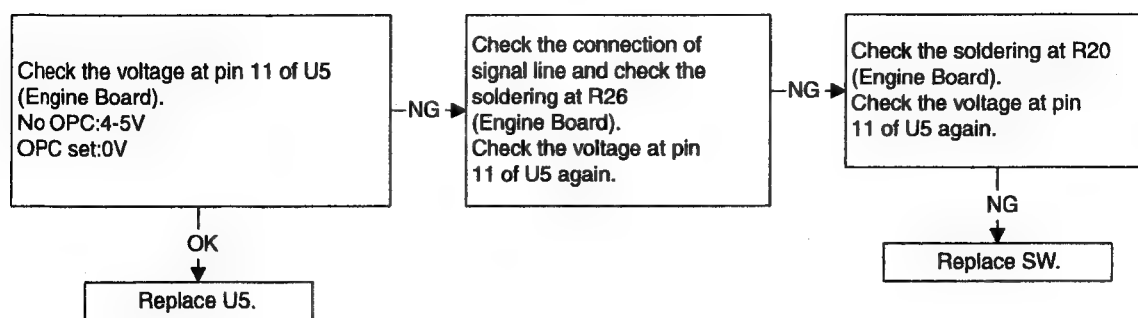
7) Check the exit switch....."PAPER JAMED"



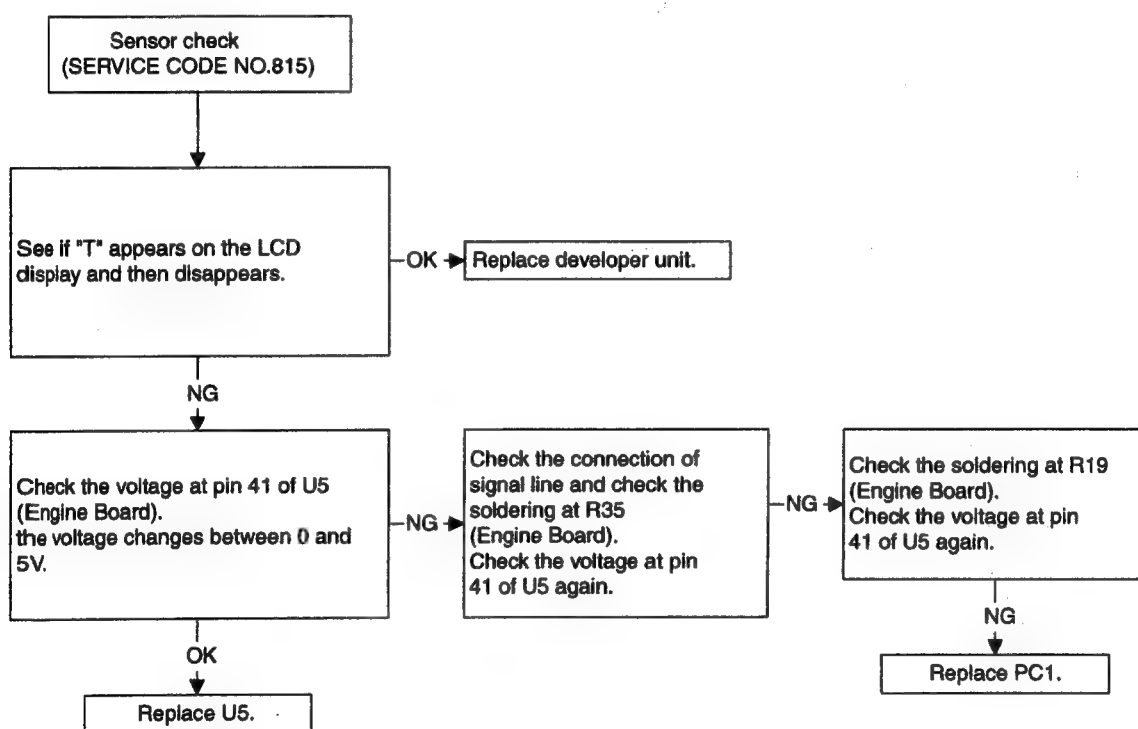
8) Check the regist sensor....."FAILED PICKUP"



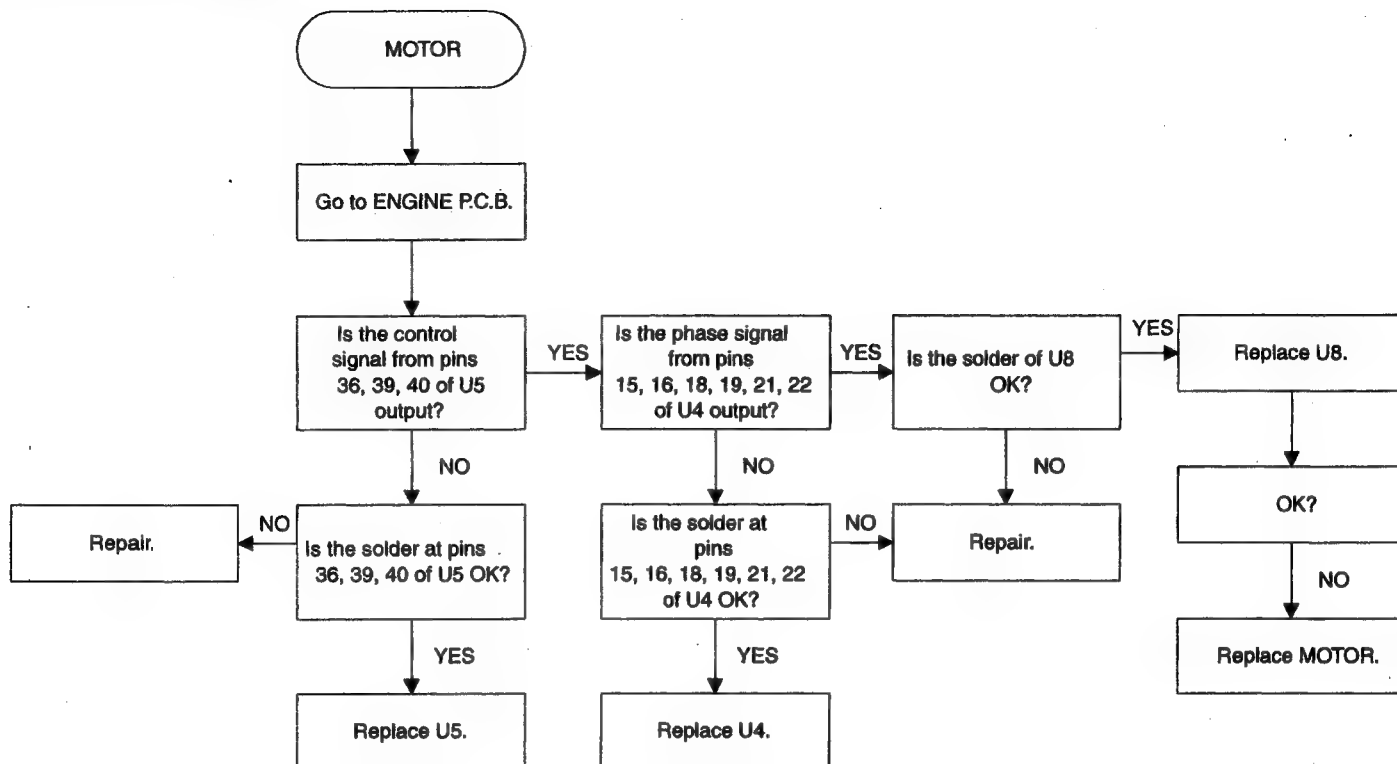
9) Check the OPC sensor....."CHANGE DRUM","CHECK DRUM"



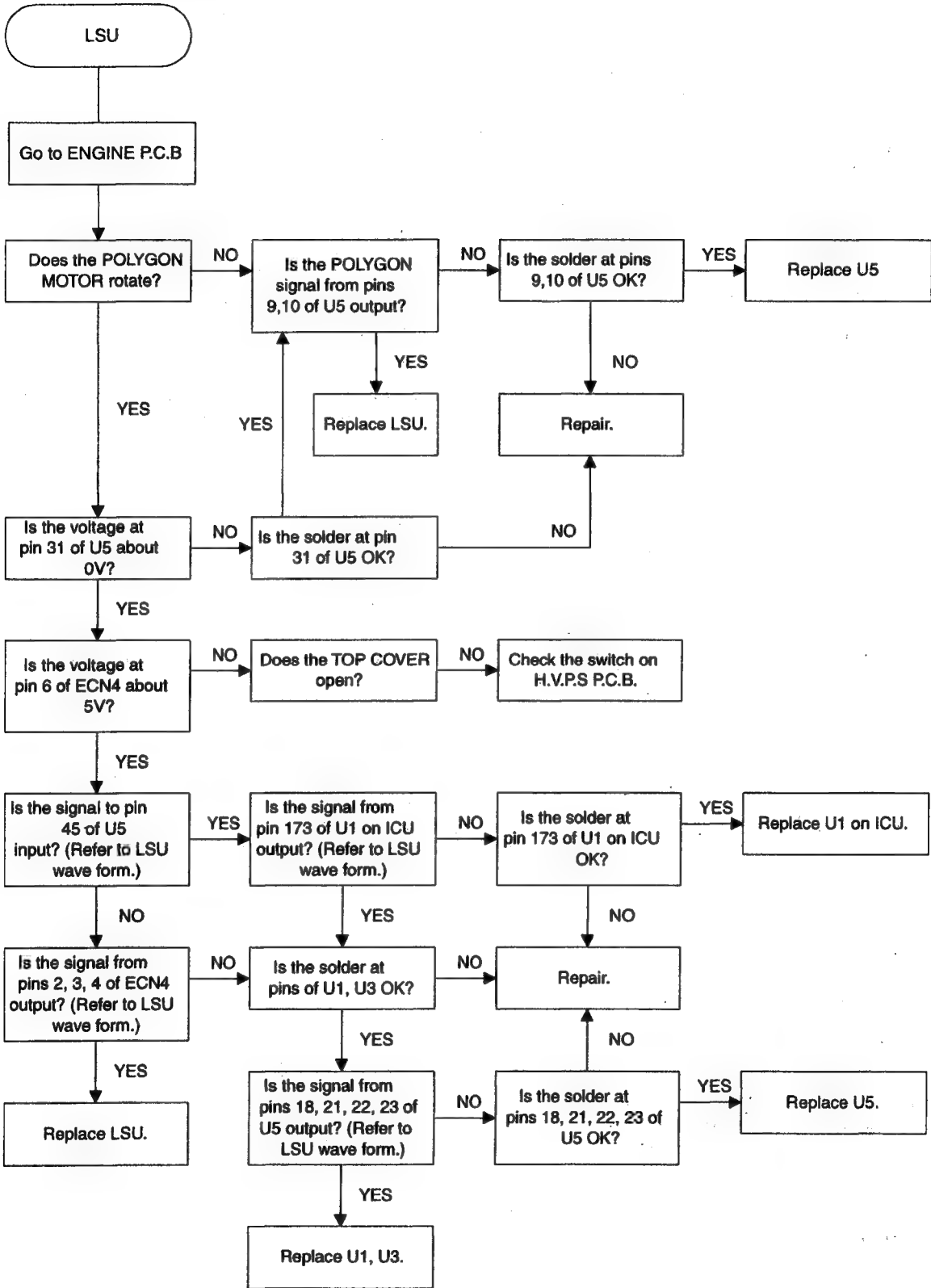
10) Check the toner sensor....."TONER LOW","CHECK TONER"



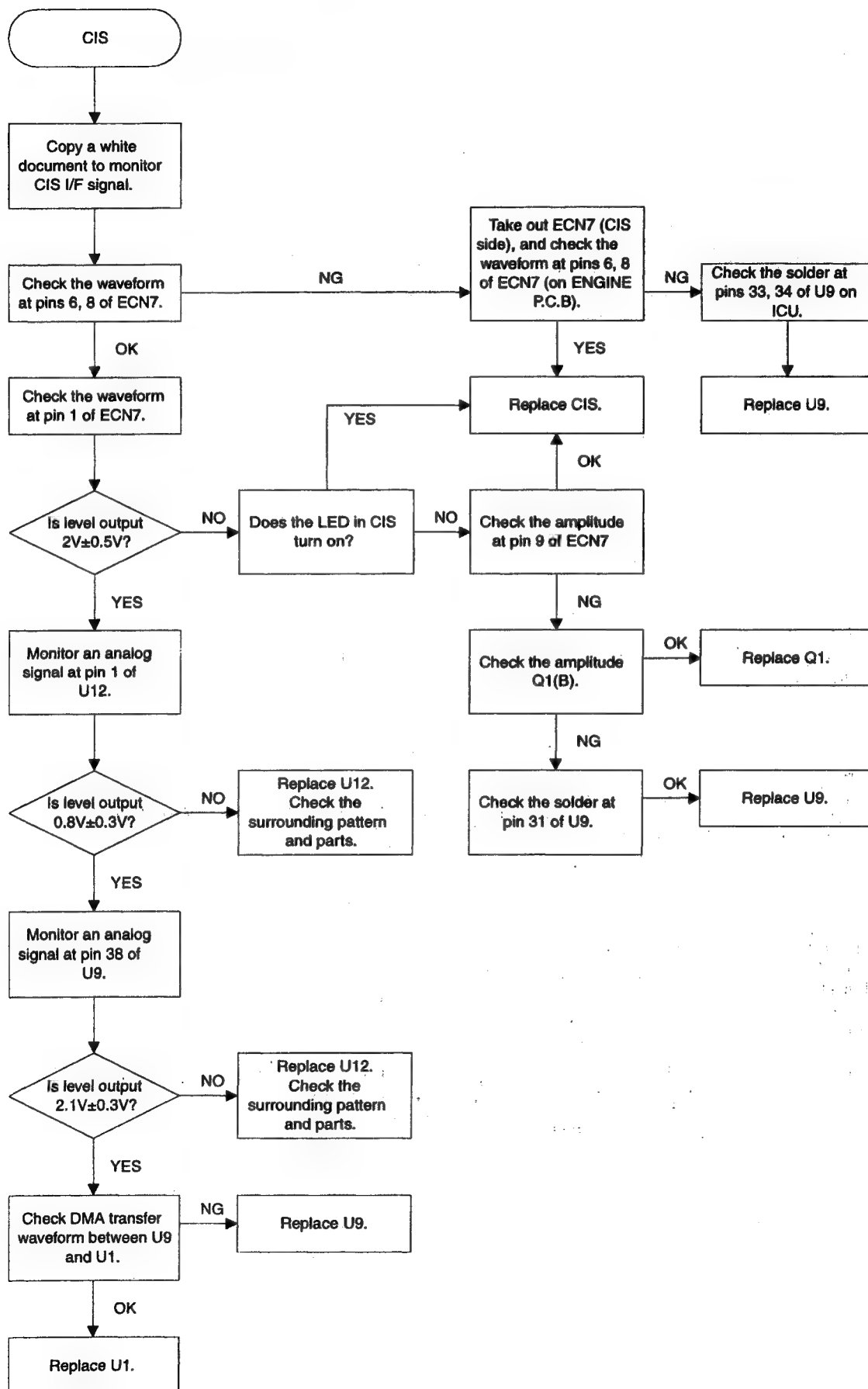
3.10.5 MOTOR SECTION



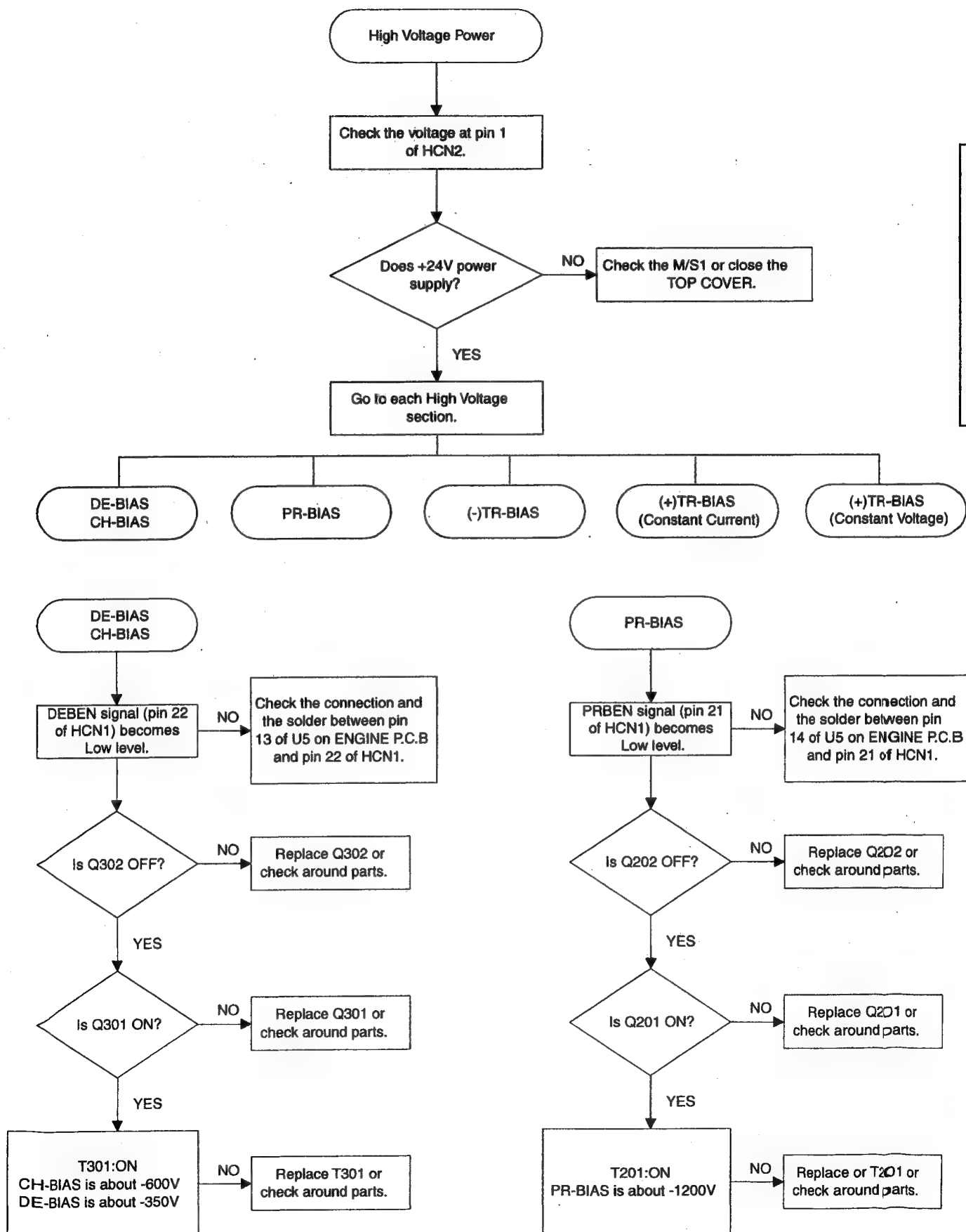
3.10.6 LSU SECTION

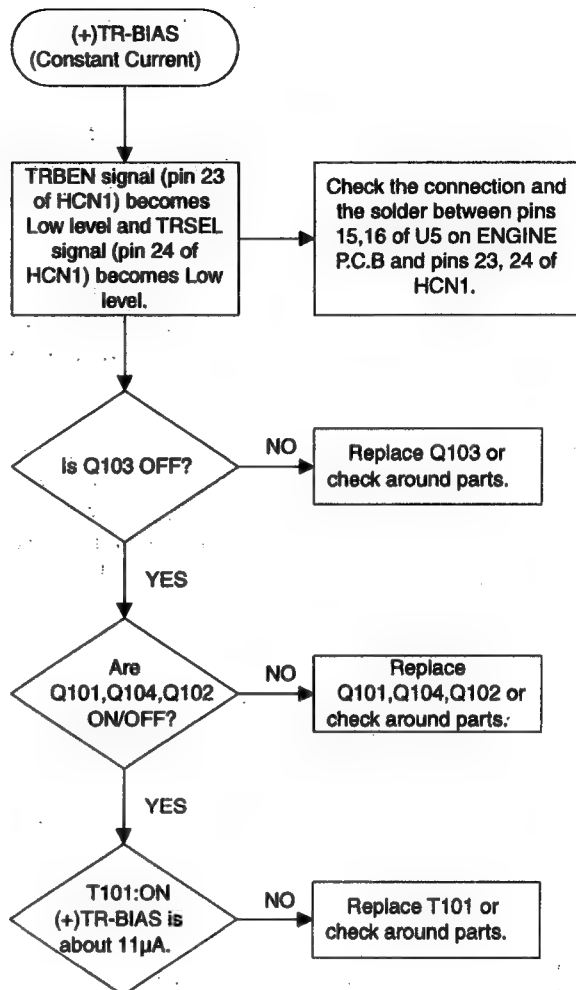
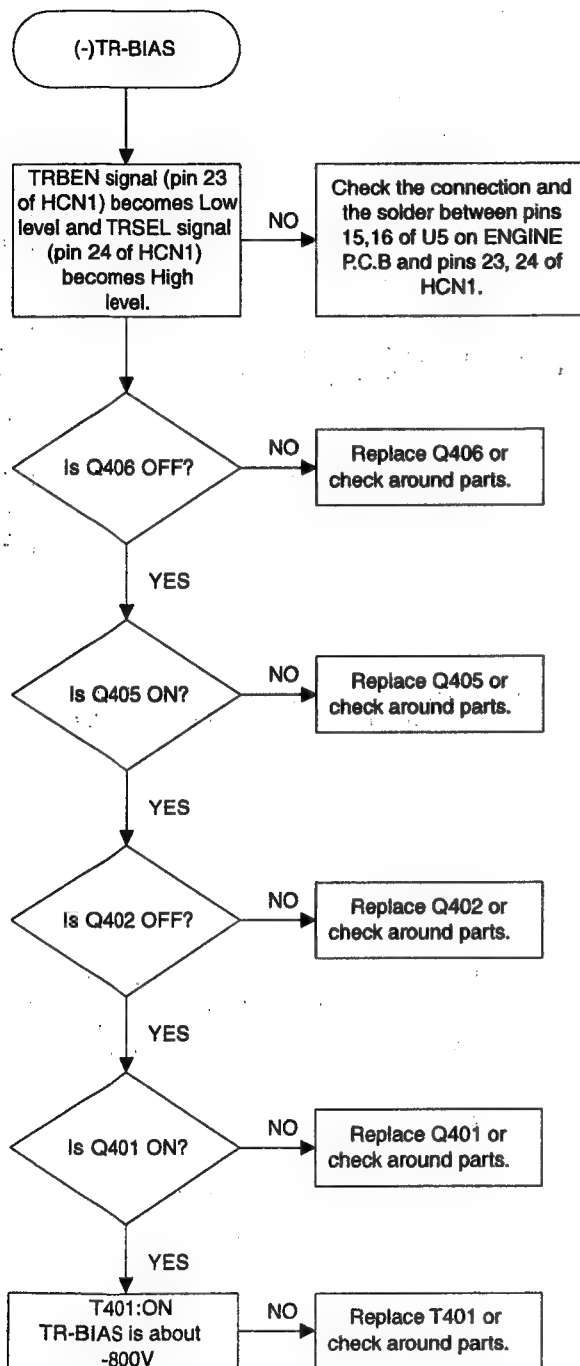


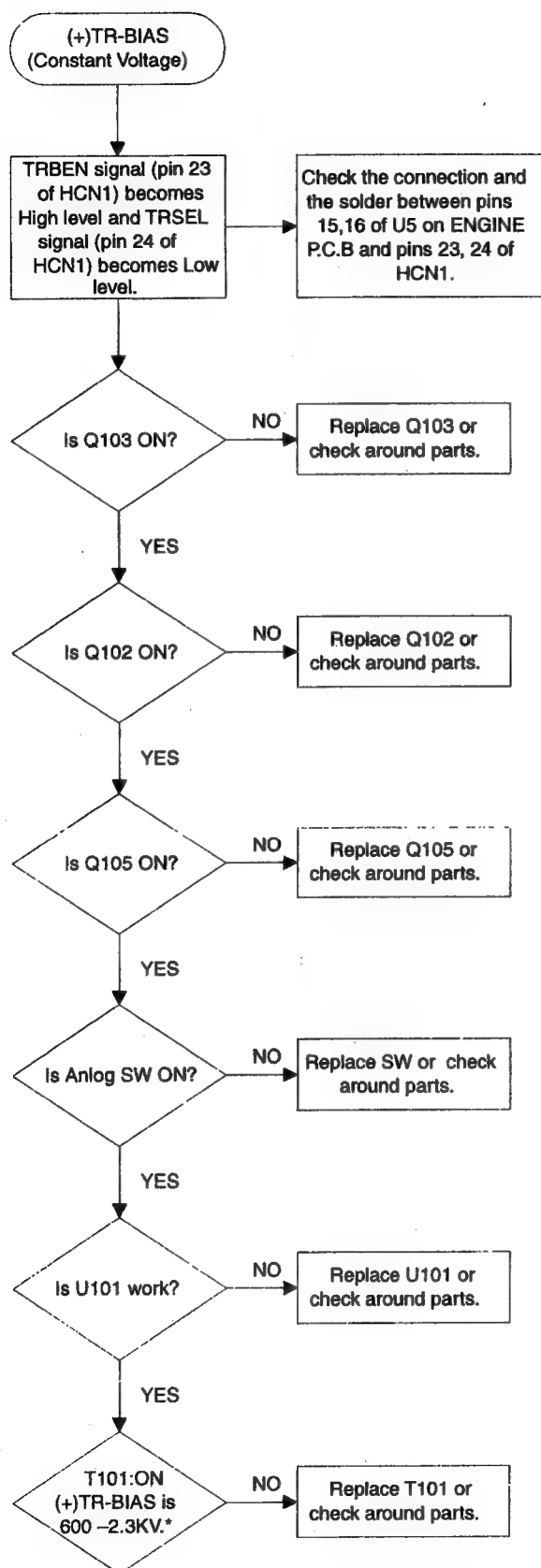
3.10.7 CONTACT IMAGE SENSOR SECTION



3.10.8 HIGH VOLTAGE POWER SUPPLY SECTION







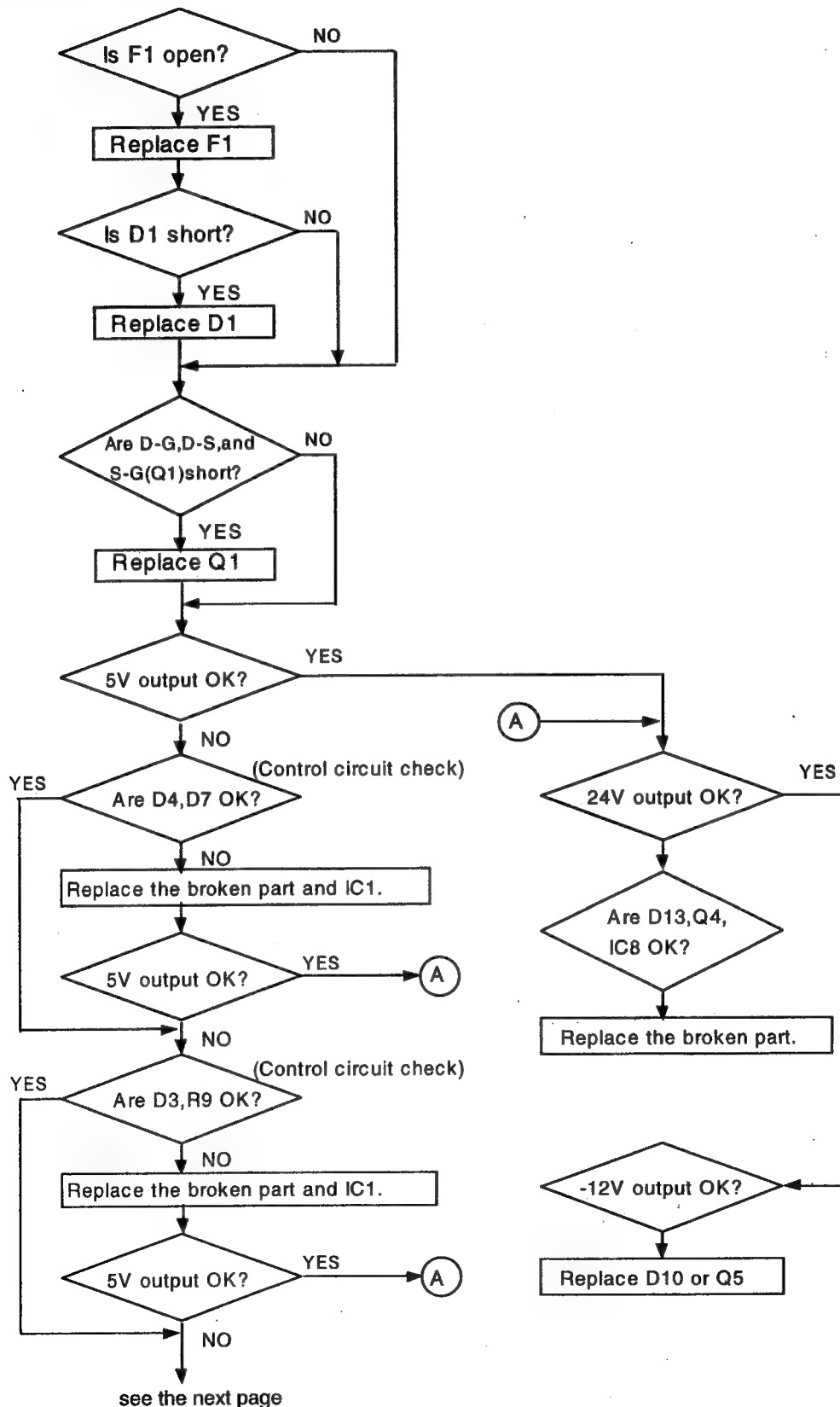
* This voltage changes according to paper size, environment and so on.

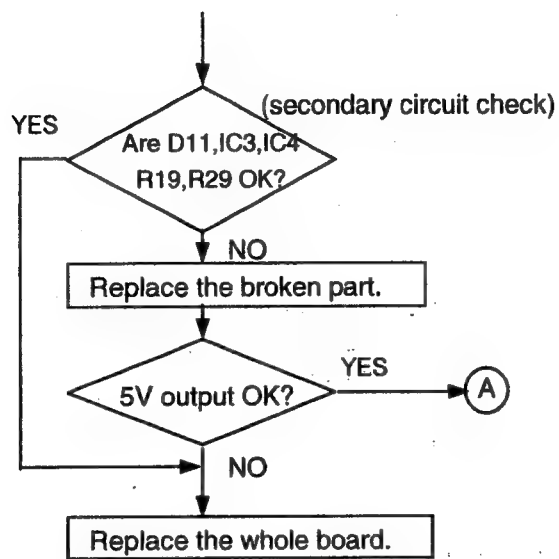
3.10.9 SMPS SECTION

Our recommendation For Troubleshooting is as follows.

This procedure comes from our experience of troubleshooting in our lab.

* Before turnig on the power supply ,you should check F1.





4. PANA LINK**① List of PANA LINK and help instructions**

To obtain information about the Multi-Function Center applications, use the help function.
For help, follow these steps.

For Windows 95 Users:

1. Click the **Start** button.
2. Click **Programs**.
3. Click **PANA LINK**.
4. Click **PANA LINK HELP**.
5. Click **Index** or **Contents** and choose the subject you need help with.

FUNCTIONS OF THE MULTI-FUNCTION CENTER APPLICATIONS

Applications	Functions
PANA LINK	<i>Introduction</i> Hardware requirements for PANA LINK About Install/Uninstall PANA LINK Printer Driver How to Start and Exit PANA LINK About the PANA LINK Main Panel A List of the Shortcut Keys
PRINT	Printing from a file Checking the printing status
transmit the facsimile from the personal	About the Send a Fax panel Transmit an image file How to send a fax from a printed page Cover page Save and print of the transmission data How to make a peculiar transmission Quick transmission Sending to several people in one operation (Broadcast) Sending at a certain time Sending several documents together The Advanced dialog
receive a facsimile with the personal	Receiving a facsimile New fax notification How to make a peculiar transmission Forward the received facsimile automatically Forward the received facsimile as an e-mail message Stamp the received date (Time/Date stamp)
make a phone call	Make a phone call How to set the telephone number Dialing the telephone number manually Dial using the One-Touch keys Dial using the Address Book Dial the same person again
scan	How to scan Image quality Image Type Brightness
copy	How to copy Enlarge and reduce

Applications	Functions
Communication Log	About the Communication Log About the Sent Log About the Received Log About the Outbox Save the log Print the log Display the image of the facsimile document Send the log as an e-mail message Resend Change the destination of an unsent fax Forward Delete Change a log subject Find About the Find dialog box Sort Menu list
Address Book	About Address Book How to edit the data of the partners How to add a new entry How to change How to delete How to edit the Address Book How to create a new Address Book How to change the name of the Address book How to delete an Address Book How to change the Address Book How to edit the distribution group How to create a group How to change the group name How to delete a group How to add members to a group How to change groups How to select the number Sending a phone or fax number from the Address Book to the PANA LINK Main Panel How to move and copy Move and copy Other functions Find Sorting Simple print of the Address Book Print the Address Book in detail form Import and export the Address Book Save the Address Book Menu list
Viewer	Shortcut keys About the Viewer Setup Setup Line setup Transmission setup Reception setup System setup
One-touch	User Information Cover Page One-touch keys How to register and change an entry How to delete an entry
Troubleshooting	Common problems Problems with transmission Problems with reception Problems with scan and copy Problems about the display of errors ECP problems

4.1 Problems with PC software**1)-1 General**

PROBLEM	CAUSE & REMEDY
I do not know how to move the PANA LINK Main Panel, because there is no title bar.	<ul style="list-style-type: none"> Point at an area with no buttons or parts and drag it where you want to move.
I do not know whether the PANA LINK Main Panel is active or not.	<ul style="list-style-type: none"> The brightness of the Main Panel Display shows you whether the PANA LINK Main Panel is active or not. <Active - bright, Non active - dark>
A quick tip does not appear when I hold the mouse pointer over a button in the PANA LINK Main Panel, although I have set to display this.	<ul style="list-style-type: none"> If the PANA LINK Main Panel is non-active, the quick tip does not appear. Confirm again, after making the PANA LINK Main Panel active, by clicking anywhere on it.
The telephone number set in the Main Panel Display disappears, and the display shows, "It is used for specifying the dial data.", explanation of the button and so on.	<ul style="list-style-type: none"> The quick tip is displayed. Move the mouse cursor out of the PANA LINK Main Panel. If you do not need quick tips, open the setup dialogue and select OFF of the Quick Tip in the System tab.
The PANA LINK Main Panel disappears.	<ul style="list-style-type: none"> Look in the task tray (in the task bar). If you do not find the PANA LINK icon, it is closed. If you find the icon, the PANA LINK Main Panel is just minimized or iconified. Double-click the icon in the task tray or open the menu by right-clicking the fax icon then select Restore.
The PANA LINK Main Panel disappears just after initializing.	<ul style="list-style-type: none"> The PANA LINK Main Panel is set to minimize when PANA LINK starts. Double-click the icon in the task tray or open the menu by right-clicking the fax icon, then select Restore. If you do not want this to happen each time you start PANA LINK, press the Setup button in the PANA LINK Main Panel, and check off the Start minimized check box in the Program startup settings in the System tab.
I want to delete all of the telephone numbers set in the Main Panel Display.	<ul style="list-style-type: none"> Press the Stop button.
I cannot recognize the last part of the entry in the address list of the Address Book or Communication log, because that part ended with...	<ul style="list-style-type: none"> Put a cursor on the line between the buttons, the cursor changes shape and you can expand the area by dragging, or double-clicking.
A cover page is sent whenever I send a fax, though I do not want to send it.	<ul style="list-style-type: none"> The setting of the cover page is ON by default. To deactivate the setting, open the Setup dialogue by pressing the Setup button, and click the Default cover page at every transmission check box in the Cover page tab.
I attempted to select a telephone number from the Address Book to the PANA LINK Main Panel, but I selected a fax number by mistake.	<ul style="list-style-type: none"> You can change your selection in the PANA LINK Main Panel. Double click the number you set in the Main Panel Display, the fax number switches into the telephone number. You can also right-click the entry to select a specific number.
I cannot use the Dial button, even though I specified a telephone number.	<ul style="list-style-type: none"> If there is transmission data or a document is set in the fax, you can only use the fax transmission function. If you want to make a phone call, please delete the transmission data.
When I exit PANA LINK, the Viewer does not close.	<ul style="list-style-type: none"> The viewer can be operated separately, so when the PANA LINK is closed, it remains open.

1)-2 General (cont.)

PROBLEM	CAUSE & REMEDY
The PANA LINK does not work properly.	<ul style="list-style-type: none"> Click the <input checked="" type="checkbox"/> button to exit PANA LINK, and restart. If PANA LINK does not closed, please force it to close by pressing Ctrl+Alt+Delete keys.
I cannot send or receive a fax through PANA LINK.	<ul style="list-style-type: none"> When you use a PC with an ECP printer port such as a Compaq Deskpro or an IBM Aptiva, you may need to change the ECP port into a standard port: <ol style="list-style-type: none"> Click the Start button, point the Settings, then Control Panel. Double-click System. Double-click Ports [COM&LPT] from the Device Manager tab. Double-click ECP Printer Port (LPT1). Click the Update Driver... button on the Driver tab. –The Update Device Driver Wizard starts. Click the "NO, select driver from list" button. Click Show all hardware and choose Standard Port types from the Manufacturers list, and Printer Port from Models. Click the Finish button. <p>If you are required to insert the Windows 95/98 CD-ROM, please do the following.</p> <ol style="list-style-type: none"> Insert the Windows 95/98 CD-ROM. The Copying files dialogue box appears. Click the Browse button, and then choose Win95/98 folder from the list. Click the OK button. The Version Conflict dialogue box appears. Please check Your version here. If it is 4.00.955, click Yes. <p>You may need to change the ECP port in the BIOS system settings. It varies by PC, please refer to your PC operating instructions or manufacturer for instructions.</p> <p>Please verify the LPT.VXD version is 4.00.955:</p> <ol style="list-style-type: none"> Click the Start button, point to Settings, then Control Panel. Double-click System, and then open the Device Manager tab. Double-click Ports [COM&LPT] from the Device Manager tab. Double-click Printer Port (LPT1). Click the Driver tab. Verify whether the File version is 4.00.955. <p>Note: If it is an old version, you must uninstall PANA LINK first, then reboot the PC, and re-install it again.</p>
I cannot open a TIFF file.	<ul style="list-style-type: none"> You must change the compression format of the file. For example, to convert an image using WANG Imaging, proceed as follows: <ol style="list-style-type: none"> Click on the Start button, point to Programs – Accessories, then click Imaging. Open the TIFF file that you cannot open in the PANA Viewer. Open the Page menu, then click Convert. –The Convert dialogue box appears. Click the Compression tab, then choose [CCITT Group 3 (1d) Modified Huffman] from the Compression drop-down list. Click the OK button. –The file's compression format is changed.

2) Printing

PROBLEM	CAUSE & REMEDY
I cannot print.	<p>• Please verify the following.</p> <ol style="list-style-type: none"> 1. Driver settings: If you change the driver settings in the Panasonic KX-FLM600/650 dialogue box, you may be able to print. 2. Preview window: If the image is not properly displayed in the Preview window, your file may contain errors. Try printing a different file. Also, there may be a problem with the application you are using. 3. Bad connection between PC and printer: Verify the printer is properly connected and plugged in. 4. Re-install: Uninstall PANA LINK, reboot your PC, then re-install it. 5. Port setting: If the printer port is not set to FLM600, you cannot print. <ol style="list-style-type: none"> 1) Click the Start button, point to Settings, then Printer. 2) Choose Properties from the printer's pop-up menu. –The Properties dialogue box appears. 3) Click the Details tab, and check the Print to the following port drop down list box. If a different port is selected, re-select FLM600 (KX-FLM600 port). 4) Click the OK button. 6. Bi-Directional Parallel Port. (ECP mode): If using ECP (Extended Capability Port) mode, you may not be able to print. Please change it into a standard port: <ol style="list-style-type: none"> 1) Click the Start button, point to Settings, then Control Panel. 2) Double-click System, and then open the Device Manager tab. 3) Double-click Ports [COM&LPT] from the Device Manager tab. 4) Double-click the ECP Printer Port. 5) Click the Update Driver... button from the Driver tab. 6) Change the ECP port into Printer Port (LPT1). <p>If the same error occurs repeatedly even after changing the printer port, check the BIOS settings or update LPT.VXD. Please refer your computer manufacturer for the latest LPT.VXD and the BIOS settings. LPT.VXD version 4.00.955 is required. If you do not use the correct version, we cannot guarantee that the driver will work properly.</p> <p>Reboot your PC, and try to test printing.</p> <ol style="list-style-type: none"> 1) Click the Start button, point to Settings, then Printers. 2) Choose Properties from the printer's pop-up menu. –The Properties dialogue box appears. 3) Click the Print Test Page button from the General tab. <p>If the same error occurs, please see next.</p> <p>Please verify the LPT.VXD version is 4.00.955:</p> <ol style="list-style-type: none"> 1) Click the Start button, point to Settings, then Control Panel. 2) Double-click System, and then open the System Properties dialogue box. 3) Double-click Ports [COM&LPT] from the Device Manager tab. 4) Double-click Printer Port (LPT1). 5) Click the Driver tab. Verify whether the File version is 4.00.955. <p>Note: If it is an old version, you must uninstall PANA LINK first, and then restart the PC, and re-install it again.</p> <p>When you change settings manually, you must reboot your PC.</p>

3) Transmission

PROBLEM	CAUSE & REMEDY
I see a "Sending the fax ended in failure." message.	<ul style="list-style-type: none"> Possible causes are as follows. <ul style="list-style-type: none"> –Telephone circuit is not good. –You received a call-waiting signal. –The other party stopped reception. –The other party ran out of the recording paper. <p>Transmit again after confirming with the other party.</p>
I see a "No response" message.	<ul style="list-style-type: none"> The other party did not answer the call or the line was busy. Transmit again after waiting a while. The dialing mode setting (tone or pulse) is not correct. Open the Setup dialogue box and confirm the dialing mode setup check box in the Line tab.
I cannot make an international transmission.	<ul style="list-style-type: none"> Set the fax machine to the overseas transmission mode.

4) Reception

PROBLEM	CAUSE & REMEDY
The fax machine receives a fax, but I want to receive it with the PC.	<ul style="list-style-type: none"> You probably checked the [Receive directly to Facsimile Unit] check box to activate in the Reception tab in the Setup dialogue box. If so, click this check box to deactivate. The setting of the PC LINK on the fax machine is off. Turn it on. The PANA LINK application does not operate. Start the PANA LINK application.
The PC receives a fax, but I want to receive it with the fax machine.	<ul style="list-style-type: none"> Open the Setup dialogue box, then check the [Receive directly to Facsimile Unit] check box to activate in the Reception tab.
I want to print out the received fax with another printer.	<ul style="list-style-type: none"> Print after selecting the desired printer from the Print dialogue box.
The "Fax reception ended in failure." message is displayed.	<ul style="list-style-type: none"> Possible causes are as follows. <ul style="list-style-type: none"> –The line condition was not good. –The reception was interfered with the call waiting signal. <p>Check with the other party and try again.</p>

5) Scan and copy

PROBLEM	CAUSE & REMEDY
I cannot SCAN.	<ul style="list-style-type: none">• The facsimile unit is probably busy. Try again after the other operation is completed.• There might not be enough free space on the hard disk. Try again after deleting unnecessary files or closing unused applications.• There might not be enough RAM: Try again after closing some application.• Restart the PC, then try again.
The document is not pulled into the document feeder.	<ul style="list-style-type: none">• Confirm that a maximum of 15 pages are set correctly.
A document is jammed.	<ul style="list-style-type: none">• If you select Fine (200×200 dpi) in the image quality list, make sure the document is less than 655 mm (257/8"). If you select Line Art (400×400 dpi), make sure the document is less than 470 mm (18 1/2"). Remove the jammed document and try it again.
The recording paper is jammed.	<ul style="list-style-type: none">• Remove the jammed recording paper, reinsert it, then try again.
Even after clicking the Cancel button, scanning continues.	<ul style="list-style-type: none">• Please wait. Sometimes, it takes a while for the cancel request to be accepted.
I cannot scan documents using other applications.	<ul style="list-style-type: none">• Due to compatibility issues, an error may occur when you scan documents using certain applications. Scan from PANA LINK.

6) Error message

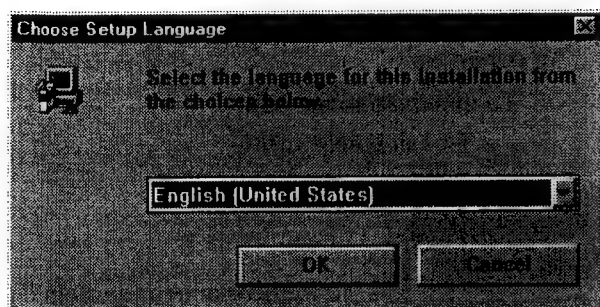
PROBLEM	CAUSE & REMEDY
"Initializing ended failure" is displayed.	<ul style="list-style-type: none">• Reconfirm the connection of the PC and the fax machine.• The setting of the PC LINK on the fax machine is off. Turn it on.

4.2 INSTALLING THE PANA LINK SOFTWARE

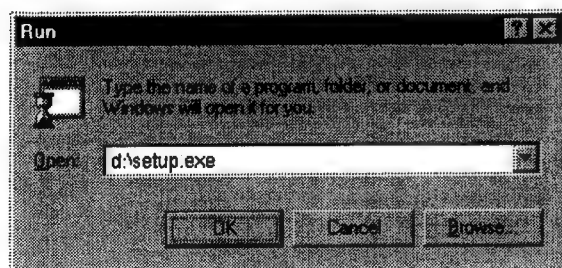
1 Start Windows 95 or Windows 98 and close all applications.

2 Insert the included CD into your CD-ROM drive.

- The language dialog box will appear. Select the desired language that you use with this software. Then click [OK].



- If the language dialog box does not appear: The installation will automatically start.
- If the language dialog box does not appear and the installation does not start automatically:
Click **Start**, choose **Run...**. Type "**d:\setup**" (where **d:** is the drive letter of your CD-ROM drive). Click **OK**.
(If you are not sure what the drive letter is for your CD-ROM drive, please use Windows Explorer and look for the CD-ROM drive.)



Note:

For detailed instructions on PANA LINK software, use the Help function. The screens shown in these instructions are from Windows 95.

Windows 3.1 or 3.11 users:

- If you are using Windows 3.1 or 3.11, follow these steps to install the software.
 - 1.** From the Program Manager, click **File**, choose **Run...**
 - 2.** Type "**d:\setup**" (where **d:** is the drive letter of your CD-ROM drive).
 - 3.** Click **OK**.
- The printer driver only is available. Please read a README file (README.WRI) in the CD-ROM for more information.

3 The installation will automatically start.

4 Follow the instructions on the screen until all files have been installed.

5 Be sure to read a README file for more information.

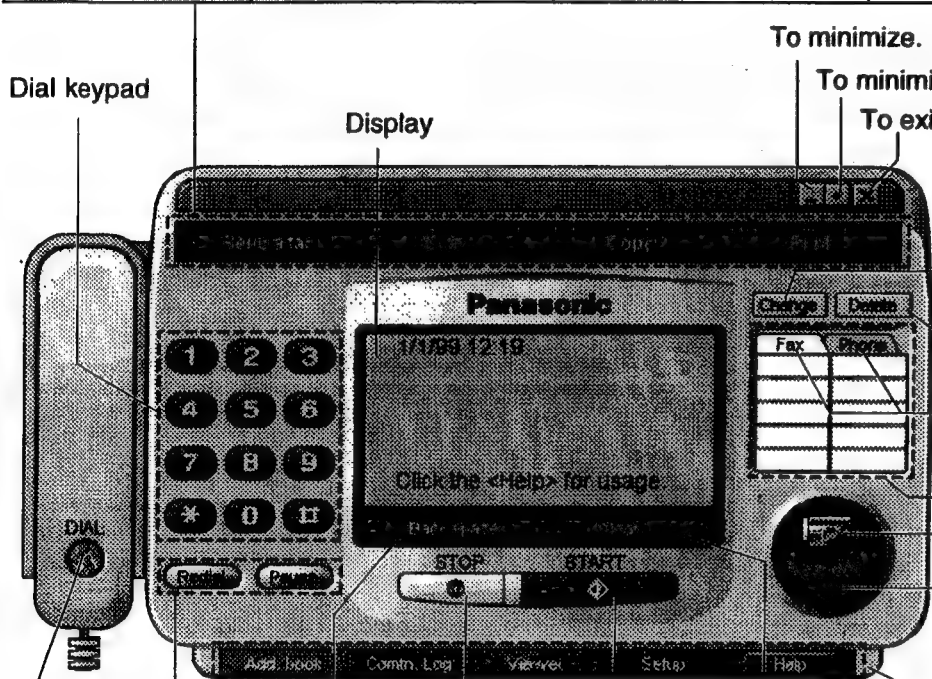
4.3 ACTIVATING THE PANA LINK SOFTWARE

1 Click **Start**.

2 Point to **Programs**, point to PANA LINK and click **PANA LINK**.

- The PANA LINK main panel will appear.

Send a fax To send a file created on the PC.	Scan To create an image file by scanning the document set in the fax machine.	Copy To make a copy of the document set in the fax machine.	Print To print a file created on the PC.
--	---	---	--



Dial keypad

Display

To minimize.

To minimize to an icon.

To exit PANA LINK.

To register or change data in the one-touch memory.

To delete the data in the one-touch memory.

To switch On-touch page.

One-touch dial

Reception icon

Displays the number of the received documents which have not been viewed yet.

To make a phone call.

Redial To redial the last number dialed.	Pause To insert (a) pause(s) in the telephone number.
--	---

To delete one figure of a telephone number.

To start fax transmission or reception.

To stop fax transmission or reception.

To delete a selected telephone number.

Add. book To store and view information in your address book.	Comtn. Log To display the record of transmitted/received facsimile documents and manage the documents waiting to be sent.	Viewer To display an image sent or received with PANA LINK.	Setup To set PANA LINK options.	Help For detailed instructions on PANA LINK software.
---	---	---	---	---

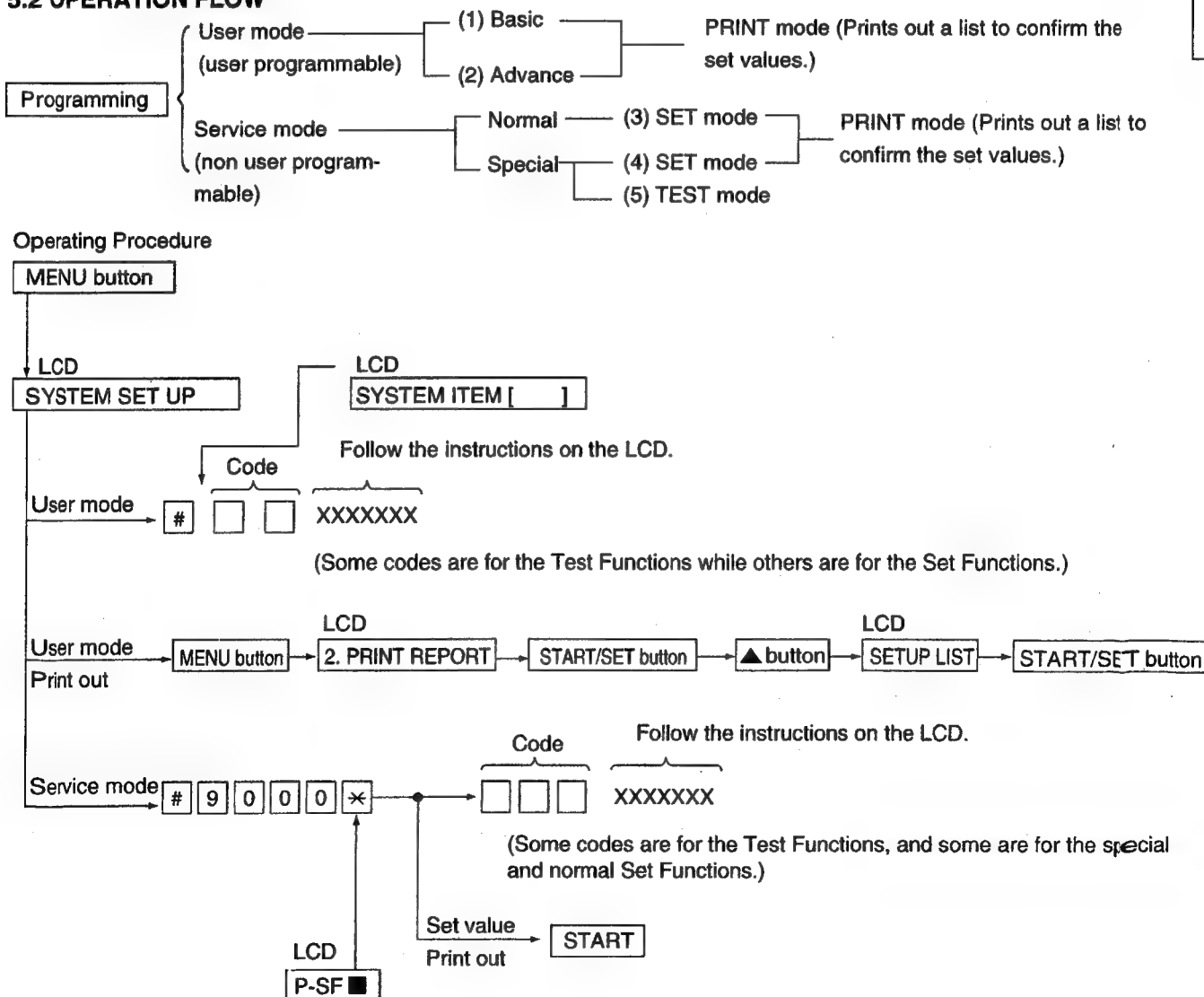
5. PROGRAMMING AND LISTS

The programming functions are used to program the various features and functions of the unit, and to test the unit. This facilitates communication between the user and the service man while programming the unit.

5.1 OPERATION

There are 2 basic categories of programming functions, the User Mode and the Service Mode. The Service Mode is further broken down into the normal and special programs. The normal programs are those listed in the Operating Instructions and available to the user. The special programs are those only listed here and not displayed to the user. In both the User and Service Modes, there are Set Functions and Test Functions. The Set Functions are used to program various features and functions, and the Test Functions are used to test various functions. The Set Functions are accessed by entering their code, changing the appropriate value, then pressing the SET key. The Test Functions are accessed by entering their code and pressing the key listed on the menu. While programming, to cancel any entry, press the STOP key.

5.2 OPERATION FLOW



KX-FLM600G

Code	Function	Set Value	Effective Range	Default	Remarks
501	Pause time set	X 100 msec	001~600	030	
502	Flash time set	X 10 msec	01~99	20	
511	Vox sense	1:High 2:Low	1, 2	1	
520	CED frequency select	1:2100 Hz 2:1100 Hz	1, 2	1	See page 67.
521	International mode select	1:ON 2:OFF	1, 2	2	See page 67.
522	Auto standby select	1:ON 2:OFF	1, 2	1	The resolution reverts to the default when transmission is complete.
523	Receive equalizer select	1:0 km 2:1.8 km 3:3.6 km 4:7.2 km	1~4	1	When the telephone station is far from the unit or reception cannot be performed correctly, adjust.
524	Transmission equalizer select	1:0 km 2:1.8 km 3:3.6 km 4:7.2 km	1~4	1	
546	PBX flash time	X 10mm	01~99	08	
550	Memory clear: To reset the value to the default one, except the top margin (853) and left margin (854).				"START" input
551	ROM check				See page 130.
552	DTMF single tone test	1:ON 2:OFF	1, 2	2	See page 130.
553	Monitor on FAX communication select	1: OFF 2:PHASE B 3:ALL	1~3	1	
554	Modem test				See page 130.
557	LED test				See page 130.
558	LCD test				See page 130.
561	KEY test				See page 130.
563	CIS position adjustment value set	X 1 mm	1~7	4	
568	Time of detecting DC-Loop	X 1 mm	1~8	62	
571	ITS auto redial time set	X number of times	00~14	05	

Code	Function	Set Value	Effective Range	Default	Remarks
572	ITS auto redial line disconnection time set	X second	005~999	065	
573	Remote turn-on ring number set	X number of rings	01~99	10	
574	Dial Tone Detect	1:ON 2:OFF	1,2	2	
575	OFF-HOOK alarm option	1:ON 3:OFF	1,2	1	
576	DC-Loop Detect	1:ON 2:OFF	1,2	2	
590	FAX auto redial time set	X number of times	00~14	05	
591	FAX auto redial time disconnection time set	X second	005~999	065	
592	CNG transmit select	1: OFF 2:ALL 3:AUTO	1~3	2	
593	Time between CED and 300bps	1: 75 msec 2:500 msec 3:1 sec	1~3	1	See page 67.
594	Overseas DIS detection select	1:detects at the 1st time 2:detects at the 2st time	1, 2	1	See page 67.
595	Receive error limit value set	1: 5% 2:10% 3:15% 4:20%	10%	2	If the number of errors during transmission exceeds this value, the sending side terminates the call.
596	Transmit level set	X dBm	- 15~00	09	Values entered without a "minus sing" will be regarded as negative.
598	Receiving sensitivity	43= -43 dBm	20~48	41	See page 67.
599	ECM Memory size	1:256K byte 2:64K byte	1, 2	1	
*605	Recall mode	1:Flash 2:Earth Recall	1, 2	1	
624	AT ring tone out	1:3 sec 2:5 sec	1, 2	1	Sets the response time of the PC reciving.
630	Time of power save starting	X min	1~30	5	Sets the start time of the power save in the idle status.
700	Time of EXT.TAM OGM	X sec	01~180	16	
701	Silent Detect time	X 100msec		40	
717	Transmit speed selection	1:14400BPS 2:12000BPS 3:9600BPS 4:7200BPS 5:4800BPS 6:2400BPS	1~6	1	Sets fall back speed in the transmitting mode.(See page 67.)

* 605: Used only when the option is use.

KX-FLM600G

Code	Function	Set Value	Effective Range	Default	Remarks
718	Receive speed selection	1:14400BPS 2:12000BPS 3:9600BPS 4:7200BPS 5:4800BPS 6:2400BPS	1~6	1	Sets fall back speed in the receiving mode.(See page 67.)
719	Ringer off in TEL/FAX mode	1:ON 2:OFF	1, 2	1	Selects whether the ring is on or off when the unit receives an incoming signal in the TEL/FAX mode when the ringer.
720	Tone Detect (After flashing)	1:ON 2:OFF	1, 2	2	Sets the tone detection mode after flashing
721	Pause tone detect	1:ON 2:OFF	1, 2	2	Sets the tone detection mode in pause.
722	Redial tone detect	1:ON 2:OFF	1, 2	1	Sets the tone detection mode after redialing.
724	Busy tone detection for PC fax transmission	1:ON 2:OFF	1, 2	1	
732	Auto disconnect	1:350ms 2:1800mc 3:OFF	1~3	1	
763	CNG detect time for friendly reception	1:10 sec 2:20 sec 3:30 sec	1~3	3	The period during which CNG is detected during friendly reception.
771	T1 timer	1:35 sec 2:60 sec	1, 2	1	Sets the time out.
788	Shading and detecting white peak level				See page 137.
815	Sensor & Vox check				See page 131.
852	Print test pattern				See page 130.
853	Top margin		1~9	-----	
854	Left margin		1~8	-----	
861	A4 size set	1:Letter 2:A4 3:Legal	1, 2, 3	2	
878	Auto Prepause time	x msec	00~99	30	
880	History list				See page 123.
881	Journal 2 list				See page 128.
882	Journal 3 list				See page 129.
890	TEL/FAX 1st ring back tone	1:ON 2:OFF	1, 2	1	Selects whether the TEL/FAX 1st ring back tone is ON or OFF in the TEL/FAX mode.

5.3 USER MODE (The list below is an example of the SYSTEM SETUP LIST the unit prints out.)

Einstellungen

【 Grundeinstellungsliste 】

Nr.	Leistungsmerkmal	Gegenwärtige Einstellung	
#01	Datum & Uhrzeit	01 Jan. 1999 00:00	
#02	Ihr Logo		
#03	Teilnehmerkennung		
#04	Ausdruck Übertragungsbericht	Fehler	[Fehler,Ein]
#06	Rufzähler FAX	2	[1...9]
#12	Fernabfragecode	Aus	[Ein,Aus]
Code = 11			
#13	Wahlverfahren	MFV	[MFV,IWV]
#14	PC Verbindung	Ein	[Ein,Aus]

Set Value

【 Erweiterte Einstellungsliste 】

Nr.	Leistungsmerkmal	Gegenwärtige Einstellung	
#22	Automatischer Journalausdruck	Ein	[Ein,Aus]
#23	Übersee-Modus	Aus	[Ein,Aus]
#25	Zeitversetzte Übertragung	Aus	[Ein,Aus]
Ziel =			
Code Start-Zeit = 00:00			
#30	Rufzähler Faxweiche	3	[3...6]
#37	Automatischer Verkleinerung	Ein	[Ein,Aus]
#38	Halbton-Modus	Autom.	[Foto,Automatisch]
#39	LCD-Kontrast	Normal	[Normal,Dunkel]
#40	Stilleerkennung	Aus	[Ein,Aus]
#41	Fax Ferneinschaltung	Ein	[Ein,Aus]
Einschaltcode = *9			
#44	Empfangs-Signalisierung	Ein	[Ein,Aus]
#46	Erweiterter Empfang	Ein	[Ein,Aus]
#48	Sprache	Deutsch	[Deutsch,English]
#60	Express-Modus	Aus	[Ein,Aus]
#62	Telefonanschluß	AMT	[AMT,NBST]
#63	AKZ 1	=	
#64	AKZ 2	=	
#65	AKZ 3	=	
#66	AKZ 4	=	
#68	ECM-Übertragung	Ein	[Ein,Aus]
#71	Rufmelodie	A	[A,B,C]

Set Value

Note:

1. The above values are the default values.
2. For #06 the display will be different depending on the receive mode.

The example above is the TAD/FAX mode.

For the fax only mode, " #06 Fax ring count 2 [1...4] " will be displayed.

5.4 SERVICE MODE SETTINGS (Example of a printed out list)
【 Service Daten Liste 】

Code		Set Value	
501	Pausenzeit	= 030*100ms	[001...600]*100ms
502	Flashdauer	= 20*10ms	[01...99]*10ms
520	CED Frequenz	= 2100Hz	[1=2100 2=1100]Hz
521	Intl. Modus	= Aus	[1=Ein 2=Aus]
522	Bereitschaftsmodus	= Ein	[1=Ein 2=Aus]
523	Empfangsentzerrung	= 0.0Km	[1=0.0 2=1.8 3=3.6 4=7.2]
524	Sendeentzerrung	= 0.0Km	[1=0.0 2=1.8 3=3.6 4=7.2]
605	Signal-Taste[●]	= FLASH	[1=FLASH 2=ERDE]
630	Sparmodus	= 05min	[01...30]min
700	Ansagezeit/TAM	= 16sek.	[01...180]sek.
701	Stilleerkennungzeit	= 40*100ms	[01...99]*100ms
853	Oberer Druckrand	= 3	[1...5]
854	Linker Druckrand	= 2	[1...3]

【 Spezielle Service Einstellungen 】

511	546	552	553	563	568	571	572	573	575	576	590	591
1	08	2	1	04	62	05	065	10	1	2	05	065
592	593	594	595	596	598	599	624	717	718	719	720	721
2	1	1	2	09	41	1	1	1	1	1	2	2
722	724	732	763	771	861	890						
1	1	1	3	1	2	1						

Betriebsstunden = 00000 Stunden

FCU Version = E421GA C2DC
 ICU Version = 38
 ENGINE Version = 41

E 4 2 1 G A —(1) C 2 D C —(49) 3 8 —(50) 4 1 —(50)
 N O N E —(3)
 N O N E —(4)
 N O N E —(5)
 (6) 0 0 0 0 0 J a n —(7) 0 1 —(8) 2 0 0 0 —(9) 1 2 0 0 A M —(10)
 (11) 0 0 0 0 0 0 0 0 0 0 —(12) (14) (15)
 (13) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 N O N E —(16) T E L —(17)
 0 0 0 0 0 0 0 0 0 0 T O N E L E G A L —(19) 0 0 0 0 2 —(20)
 (21) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 N O N E —(24) N O N E —(25) 0 0 0 0 0
 (26) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 —(29) (34)
 (30) 0 0 1 0 0 0 (32) 0 0 0 0 0 0 C O M P L E T E —(33) 0 0 0 0 0 0 0 0 0 0 —(35)
 (36) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 —(39) (40) 0 0 0 0 0 0 0 0 0 0 —(41)
 (42) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 —(45) 0 0 0 0 0 —(46)
 2 0 2 0 2 0 2 0 3 C 3 A 3 1 0 4 3 A 3 1 3 A 3 1 3 A
 3 A 0 4 3 1 3 2 3 A 3 A 0 4 2 0 2 0 2 0 0 4 2 5 2 5
 2 6 0 4 2 0 2 0 3 C 3 9 3 A 3 A 3 A 3 8 3 9 3 A
 0 4 3 9 3 9 3 A 3 8 3 8 3 A 0 4 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Descriptions of individual items on the previous page.

- (1) **ROM VERSION (FCU)**
EPROM version
- (2) **SUM**
EPROM internal data calculation.
- (3) **YOUR LOGO**
The recorded LOGO in the unit. If it is not recorded, NONE will be displayed.
- (4) **YOUR TELEPHONE NUMBER**
The recorded user telephone number in the unit. If it is not recorded, NONE will be displayed.
- (5) **FAX PAGER NUMBER**
If you program a pager number into the unit, the pager number will be displayed here.
- (6) **FACTORY - CUSTOMER**
This shows how many days from factory production until the user turns ON the unit.
- (7) **MONTH**
(8) **DAY**
(9) **YEAR**
(10) **TIME**
- The shows the very first month, date, year and time set by the user after they purchased the unit.
- (11) **USAGE TIME**
The amount of time the unit has been powered ON.
- (12) **FACTORY - NOW**
This shows how many days from factory production until the user prints out this history list.
- (13) **TEL MODE**
The amount of time the TEL mode setting was used.
- (14) **FAX MODE**
The amount of time the FAX mode setting was used.
- (15) **TEL/FAX MODE**
The amount of time the TEL/FAX mode setting was used.
- (16) **ANS/FAX MODE**
The amount of time the ANS/FAX mode setting was used.
- (17) **FINAL RECEIVE MODE**
The last set receiving mode by the user.
- (18) **TONE/PULSE SELECTION**
The most recently used setting used, either TONE or PULSE.
- (19) **AUTO REDUCTION**
The compression length when receiving.
- (20) **SETTING NO. OF DIRECTORY**
The recorded directory stations (one touch and JOG DIAL).
- (21) **NUMBER OF COPY**
The number of pages copied.
- (22) **NUMBER OF RECEIVE**
The number of pages received.
- (23) **NUMBER OF SENDING**
The number of pages sent.
- (24) **NUMBER OF CALLER ID**
The number of times Caller ID was received.
- (25) **NUMBER OF RECORDING MESSAGE**
The number of messages recorded in TAM.
- (26) **NUMBER OF PC SCAN**
The number of times multifunction was used for the Scanner. (The number of pages scanned. If the unit does not have a PC interface, NONE will be printed.)
- (27) **NUMBER OF PC-PRINT**
The number of times multifunction was used for the Printer. (The number of pages printed. If the unit does not have a PC interface, NONE will be printed.)
- (28) **NUMBER OF RECEIVING TO PC**
The number of times received in the PC through the FAX serial interface (RS232C). (The number of pages received. If the unit does not have a PC interface, NONE will be printed.)
- (29) **NUMBER OF SENDING FROM PC**
The number of times transmitted from the PC through the FAX serial interface (RS232C). (The number of pages transmitted. If the unit does not have a PC interface, NONE will be printed.)
- (30) **NUMBER OF PRINTING WARNING LIST**
The number of warning lists printed until now.
- (31) **NUMBER OF PRINTING HELP**
The number of help lists printed until now.
- (32) **NUMBER OF DIVIDED PRINTING IN FAX RECEPTION**
The number of faxes received that were divided into more than one sheet since the unit was purchased.
- (33) **DETECTION OF RS232C**
When the fax and PC serial interface (RS232C) are connected and the signal is received correctly, COMPLETE will be printed. For models without a PC interface or when there is a PC interface but the signal cannot be received between the fax and PC, INCOMPLETE will be printed.
(The number of pages transmitted. If the unit does not have a PC interface, NONE will be printed.)

- (34) NO. OF IQ FAX LOADING -OK

(35) NO. OF IQ FAX LOADING -NG

You may not be able to use IQ-FAX if the special subscriber information is not loaded from the IQ-FAX center before use. Depending on the conditions of the communication line, it may not be completed in one time, so retried will be performed. The number of times there was an OK and NG are printed.

(36) FAX MODE

Means the unit received a fax message in the FAX mode.

(37) MAN RCV

Means the unit received a fax message by manual operation.

(38) FRN RCV

Means the unit received a fax message by friendly signal detection.

(39) VOX

Means the unit detected silence or no voice.

(40) RMT DTMF

Means the unit detected DTMF (Remote Fax activation code) entered remotely.

(41) PAL DTMF

Means the unit detected DTMF (Remote Fax activation code) entered by a parallel connected telephone.

(42) TURN-ON

Means the unit started to receive after 15 rings. (Remote Turn On: Service Code #573)
- (43) TIME OUT

Means the unit started to receive after Ring Time Out in the TEL/FAX mode.

(44) IDENT

Means the unit detected Ring Detection.

(45) CNG OGM

Means the unit detected the CNG while it was sending the Dummy Ring Back Tone in the TEL/FAX mode.

OR

Means the unit detected the CNG while it was sending the OGM in the TAD/FAX mode.

(46) CNG ICM

Means the unit detected the CNG while it was recording the ICM in the TAD/FAX mode.

(47) KEY OPERATION -1st 50

(48) KEY OPERATION -Last 50

Indicates 2-digit codes. Refer to "5.2 BUTTON CODE TABLE" on page 116.

- 1st 50: History of the first 50 key operations after purchase.
 - (Ex.) If 20, 3C and 39 are printed, then the MENU, # and 9 buttons were pressed.

Last 50:History of the last 50 key operations.

(49) ICU VERSION

Image Control Software Version.

(50) ENGINE VERSION

IEngine Control CPU Version.

5.5 SPECIAL SERVICE JOURNAL REPORTS

Journal 2 or Journal 3 shown below, which are special journals giving additional detailed information about the latest 35 communications, can be printed using service code 881 or 882. They can also be printed out remotely (with the existing journal). [Refer to page 81.] Journal 2 and Journal 3's data are related.

JOURNAL

Mar. 23 1998 09:51PM

NO.	OTHER FACSIMILE	START TIME	USAGE TIME	MODE	PAGES	RESULT	*CODE
01	3332222	Jan. 21 02:14PM	00'45	SND	01	OK	
02	9998765	Jan. 21 03:17PM	00'58	IQ-FAX	02	OK	
03	John	Jan. 21 05:18PM	00'48	RCV	01	OK	
04	555556677	Jan. 22 10:35AM	02'45	SND	03	COMMUNICATION ERROR	(43)

JOURNAL 2

Mar. 23 1998 09:51AM

NO.	① RCV. MODE	② SPEED (CNT.)	③ RESOLUTION	④ RCV-TRIG. (CNT.)	⑤ ERROR->MEMORY
01	TEL	9600BPS	STD.		
02	TEL	9600BPS	FINE		
03	FAX ONLY	7200BPS	STD.	FAX MOD	
04	FAX ONLY	9600BPS	STD.	CNG (0003)	

NO RESPONSE DISAPPEARED ON JOURNAL

NO.	START TIME	① RCV MODE	④ RCV-TRIG (CNT.)
-----	------------	---------------	----------------------

YOUR LOGO
YOUR FAX NUMBER

JOURNAL 3

Mar. 23 1998 09:51AM

NO.	⑥ ENCODE	⑦ MSLT	⑧ EQM (RX)	⑨ ERROR LINE (RX)	⑩ MAKER CODE
01	MH	20msec	0000	00000	79
02	MH	20msec	0000	00000	00
03	MR	20msec	1200	00013	00
04	MR	20msec	0000	00000	00

For example, the 1st communication in the Journal above is a Fax transmission in the Tel mode, at 9.6 kbps TX speed, the resolution is standard, a MH code is used, and the Maker code is 79.

The 2nd one is IQDFax in Tel mode, and the resolution is fine etc.

CNG (0003) means the 3rd time a CNG signal was received for Fax Rx from purchasing the unit until now.

Journal 2 and Journal 3 are explained on the next page.

5.5.1 JOURNAL 2

Journal 2 displays the additional detailed information about the last 35 communications.

Description of individual items from the previous page.

① RCV. MODE

Indicates which receive mode the unit was in when the unit received a fax message.
This information is also displayed when the unit transmitted a fax message.

② SPEED

Indicates the speed of the communication. If multiple pages are transmitted or received, it indicates the last page's communication speed. If there is a communication error, "?" is displayed.

③ RESOLUTION

Indicates the resolution of the communication. If multiple pages are transmitted or received, it indicates the last page's resolution. If there is a communication error, "?" is displayed.

④ RX-TRIG. (CNT.)

Indicates the trigger that causes the unit to switch to the fax receive mode. The available options are listed in the below [Refer to (36)–(41) on page 125.] The values in parentheses indicate how many times the trigger has been used. (For example, "00003" means three times.)

⑤ ERROR→MEMORY

Indicates the reason why the unit received a fax message in memory.
In the printing example on the next page, a "paper out" error occurred and direct reception to fax memory took place.

NO RESPONSE DISAPPEARED ON JOURNAL

The NO RESPONSE DISAPPEARED ON JOURNAL displays the information about the last 10 communications terminated with No Response. (Some of the communications terminated by No Response were not displayed in the JOURNAL.)

When fax transmission cannot be performed because the other party's unit is set to the TEL mode, "No response" will be printed.

5.5.2 JOURNAL 3

Description of individual items.

⑥ ENCODE

Compression Code : MH/MR

⑦ MSLT

MSLT means Minimum Scan Line Time.
Use only at the factory.

⑧ EQM

EQM means Eye Quality Monitor.
Use only at the factory.

⑨ ERROR LINE(RX)

When an error occurs while receiving a fax, this shows the number of lines received.

⑩ MAKER CODE

This shows a 2 digit code of the other party's fax machine brand.

0E: "KX" model

00: Unknown

79: "UF" model

19: "Zerex" model

5.5.3 PRINTOUT EXAMPLE

JOURNAL 2

JOURNAL 2

Mar. 25 1998 01:59PM

NO.	RCU. MODE	SPEED (CNT.)	RESOLUTION	RCU-TRIG. (CNT.)	ERROR->MEMORY
01	FAX ONLY	9600BPS	FINE.	FAX MOD	
02	FAX ONLY	9600BPS	STD.	FAX MOD	
03	FAX ONLY	9600BPS	FINE.		
04	FAX ONLY	9600BPS	FINE.	FAX MOD	
05	FAX ONLY	9600BPS	FINE.	FAX MOD	
06	FAX ONLY	9600BPS	FINE.	FAX MOD	
07	FAX ONLY	9600BPS	FINE.		
08	FAX ONLY	9600BPS	FINE.		
09	FAX ONLY	9600BPS	FINE.		
10	FAX ONLY	9600BPS	STD.	FAX MOD	
11	FAX ONLY	9600BPS	FINE.	FAX MOD	PAPER OUT
12	FAX ONLY	9600BPS	STD.	FAX MOD	
13	FAX ONLY	9600BPS	STD.		
14	FAX ONLY	?	?		
15	FAX ONLY	?	?		
16	FAX ONLY	?	?		
17	FAX ONLY	9600BPS	STD.		
18	FAX ONLY	9600BPS	FINE.	FAX MOD	
19	FAX ONLY	9600BPS	STD.	FAX MOD	
20	FAX ONLY	9600BPS	S-FINE.		
21	FAX ONLY	9600BPS	FINE.		
22	FAX ONLY	9600BPS	FINE.	FAX MOD	
23	FAX ONLY	?	?	FAX MOD	
24	FAX ONLY	9600BPS	STD.	FAX MOD	
25	FAX ONLY	9600BPS	STD.	FAX MOD	
26	FAX ONLY	9600BPS	FINE.	FAX MOD	
27	FAX ONLY	9600BPS	FINE.		
28	FAX ONLY	9600BPS	STD.	FAX MOD	
29	FAX ONLY	9600BPS	FINE.	FAX MOD	
30	FAX ONLY	9600BPS	S-FINE.	FAX MOD	
31	FAX ONLY	9600BPS	STD.	FAX MOD	
32	FAX ONLY	9600BPS	STD.	FAX MOD	
33	FAX ONLY	?	?	FAX MOD	
34	FAX ONLY	9600BPS	STD.	FAX MOD	
35	FAX ONLY	9600BPS	STD.	FAX MOD	

NO RESPONSE DISAPPEARED ON JOURNAL

NO.	START TIME	RCU MODE	RCU-TRIG. (CNT.)
-----	------------	----------	------------------

JOURNAL 3

JOURNAL 3

Mar. 25 1998 01:58PM

NO.	ENCODE	MSLT	EQM(RX)	ERROR LINE(RX)	MAKER CODE
01	MR	10msec	007A	00000	0E
02	MR	20msec	016B	00000	00
03	MH	10msec	0000	00000	00
04	MR	20msec	019B	00003	00
05	MR	20msec	0156	00011	00
06	MR	20msec	0113	00000	00
07	MR	5msec	0000	00000	79
08	MR	5msec	0000	00000	79
09	MR	0msec	0000	00000	19
10	MR	20msec	0100	00000	00
11	MR	10msec	0073	00000	0E
12	MR	20msec	012B	00000	00
13	MH	20msec	0000	00000	79
14	MH	20msec	0000	00000	00
15	MH	20msec	0000	00000	00
16	MH	20msec	0000	00000	00
17	MR	5msec	0000	00000	79
18	MR	10msec	00AB	00004	0E
19	MR	20msec	0124	00000	00
20	MR	20msec	0000	00000	00
21	MR	20msec	0000	00000	00
22	MR	20msec	0135	00000	00
23	MR	20msec	0000	00000	00
24	MR	20msec	01BC	00000	00
25	MR	20msec	01AC	00000	00
26	MR	20msec	020F	00000	00
27	MR	10msec	0000	00000	0E
28	MR	20msec	01DF	00000	00
29	MR	20msec	01EA	00000	00
30	MR	20msec	00CD	00000	00
31	MR	20msec	02F8	00000	0E
32	MR	10msec	04F8	00000	0E
33	MR	10msec	0000	00000	00
34	MR	20msec	03B6	00000	0E
35	MH	20msec	00E0	00000	00

6. TEST FUNCTIONS

The codes listed below can be used to perform simple checks of some of the unit's functions. When complaints are received from customers, they provide an effective tool for identifying the locations and causes of malfunctions.

Test mode	Type of Mode	Code <input type="text"/> <input type="text"/> <input type="text"/>	Function
		Operation after code input	
MODEM TEST	Service Mode	<input type="text"/> 5 <input type="text"/> 5 <input type="text"/> 4	First, go OFF-HOOK with the handset to enter this Test Mode. Each time you press the start key, each of the signals will be heard in the following order from the handset. 1) OFF → 2) 14400bps → 3) 12000bps → 4) 9600bps (V17) → 5) 7200bps (V17) → 6) 9600bps → 7) 7200bps → 8) 4800bps → 9) 2400bps → 10) 300bps → 11) 2100Hz → 12) 1100Hz
		START	
ROM CHECK	Service Mode	<input type="text"/> 5 <input type="text"/> 5 <input type="text"/> 1	
		START	Indicates the version and check sum of the ROM on the digital board.
		START	Indicates the version and check sum of the ROM on the engine1 board.
		START	Indicates the version and check sum of the ROM on the printing controller board.
LCD CHECK	Service Mode	<input type="text"/> 5 <input type="text"/> 5 <input type="text"/> 8	Checks the LCD indication. Illuminates all the dots to check if they are normal.
		START	
DTMF SINGLE TEST	Service Mode	<input type="text"/> 5 <input type="text"/> 5 <input type="text"/> 2	Outputs DTMF as single tones. Used to check the frequencies of the individual DTMF tones. Refer to "6.1 DTMF Single Tone Transmit Selection" on page 131.
		1..On 2..Off	
LED TEST	Service Mode	<input type="text"/> 5 <input type="text"/> 5 <input type="text"/> 7	All LEDs above the operation panel board flash on and off, or are illuminated.
		START	
KEY CHECK	Service Mode	<input type="text"/> 5 <input type="text"/> 6 <input type="text"/> 1	Checks the button operation. Indicates the button code on the LCD while the button is pressed. Refer to "6.2 Button Code Table" on page 131.
		START { any key }	
FACTORY SET	Service Mode	<input type="text"/> 5 <input type="text"/> 5 <input type="text"/> 0	Clears the memory where the user can store data.
		START	
PRINT TEST PATTERN	Service Mode	<input type="text"/> 8 <input type="text"/> 5 <input type="text"/> 2	Prints out the test pattern. Used mainly at the factory to test the print quality. You can select 1~4. (See pages 132~134.)
		START	

Test mode	Type of Mode	• Code <input type="text"/> <input type="text"/> <input type="text"/>	Function
		• Operation after code input.	
SENSOR CHECK & VOX CHECK	Service Mode	8 1 5	After entering this mode, by operating the sensor levers, etc, using your hands, each sensor and SW display above the LCD will go ON/OFF. Also, when copying a document, the related sensor will turn ON/OFF. (D, S, P, R) For each sensor's operation, refer to page 229.
		START	
		LCD display D S C O M P • R E D G T 5 2 V	
		D: Document S: Scanner read Pos. O: Operation panel cover C: Printer Cover M: Manual tray P: Paper exist R: Pick up paper *: none D: Drum exist G: Developer exist T: Toner exist 5: 5 V release 2: 2 4 V release V: Vox exist	When a document is inserted. When a document is inserted. When Operation panel is open When Top Cover is open When recording paper is set. When recording paper is set. When recording paper exist. When a drum is existing. When a developer is existing. When a toner is existing. When the voltage of 5 V is not supplied to LSU. When the voltage of 24 V is not supplied to HVPS. When VOX exist.

Note: The numbers in the boxes (XXX) indicate the keys to be input for the various test modes.

6.1 DTMF SIGNAL TONE TRANSMIT SELECTION

When set to ON (=1), the 12 keys and transmission frequencies are as shown.

key	High Frequency (Hz)	Key	Low Frequency (Hz)
"1"	697	"5"	1209
"2"	770	"6"	1336
"3"	852	"7"	1477
"4"	941	"8"	1633

When set to OFF (=2), the 12 keys and transmission frequencies are as shown.

High (Hz) \ Low (Hz)			
	1209	1336	1477
697	"1"	"2"	"3"
770	"4"	"5"	"6"
852	"7"	"8"	"9"
941	*	"0"	"#"

Note: After performing this check, do not forget to turn the setting off.
Otherwise, dialing using DTMF will not be possible.

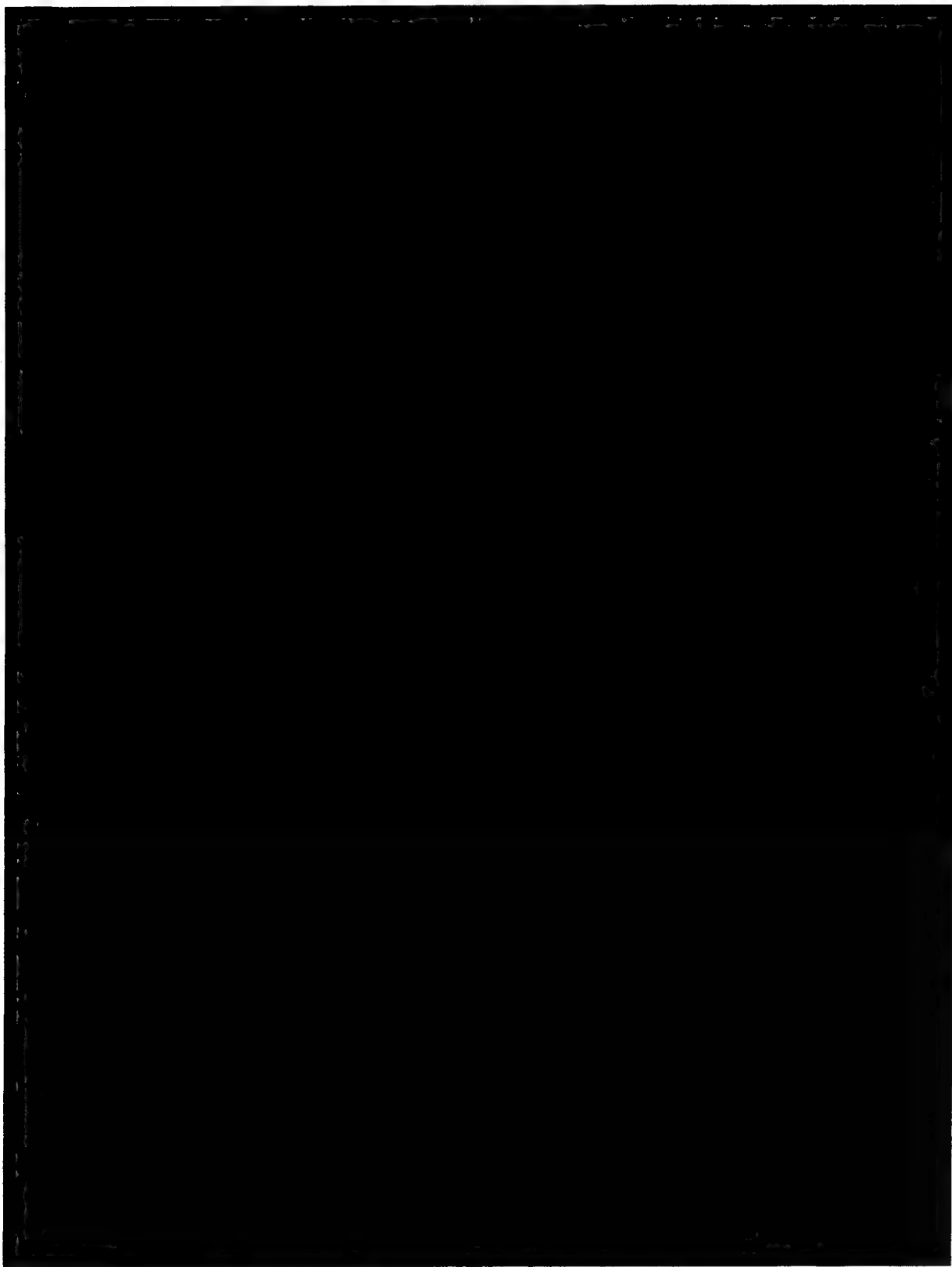
6.2 BUTTON CODE TABLE

Code	Button Name	Code	Button Name	Code	Button Name
1E	JOG (RIGHT)	25	▲ LAUTSTÄRKE	3C	#
1F	JOG (LEFT)	26	▼ LAUTSTÄRKE	3D	●
00	NO INPUT	31	1	3E	●
01	☒	32	2	48	NAME/TEL NO.
02	AUFLÖSUNG	33	3	64	STATION 1
04	STAKT / / KOPIE	34	4	65	STATION 2
05	UNTEN	35	5	66	STATION 3
08	MONITOR	36	6	67	STATION 4
0A	HÖRER STOMM	37	7	68	STATION 5
0C	ABWESEND	38	8	69	STATION 6
20	MENÜ	39	9	6A	STATION 7
22	HILFE	3A	0	6B	STATION 8
24	TELEFONBUCH	3B	*	6C	STATION 9
				6D	STATION 10
				6E	STATION 11

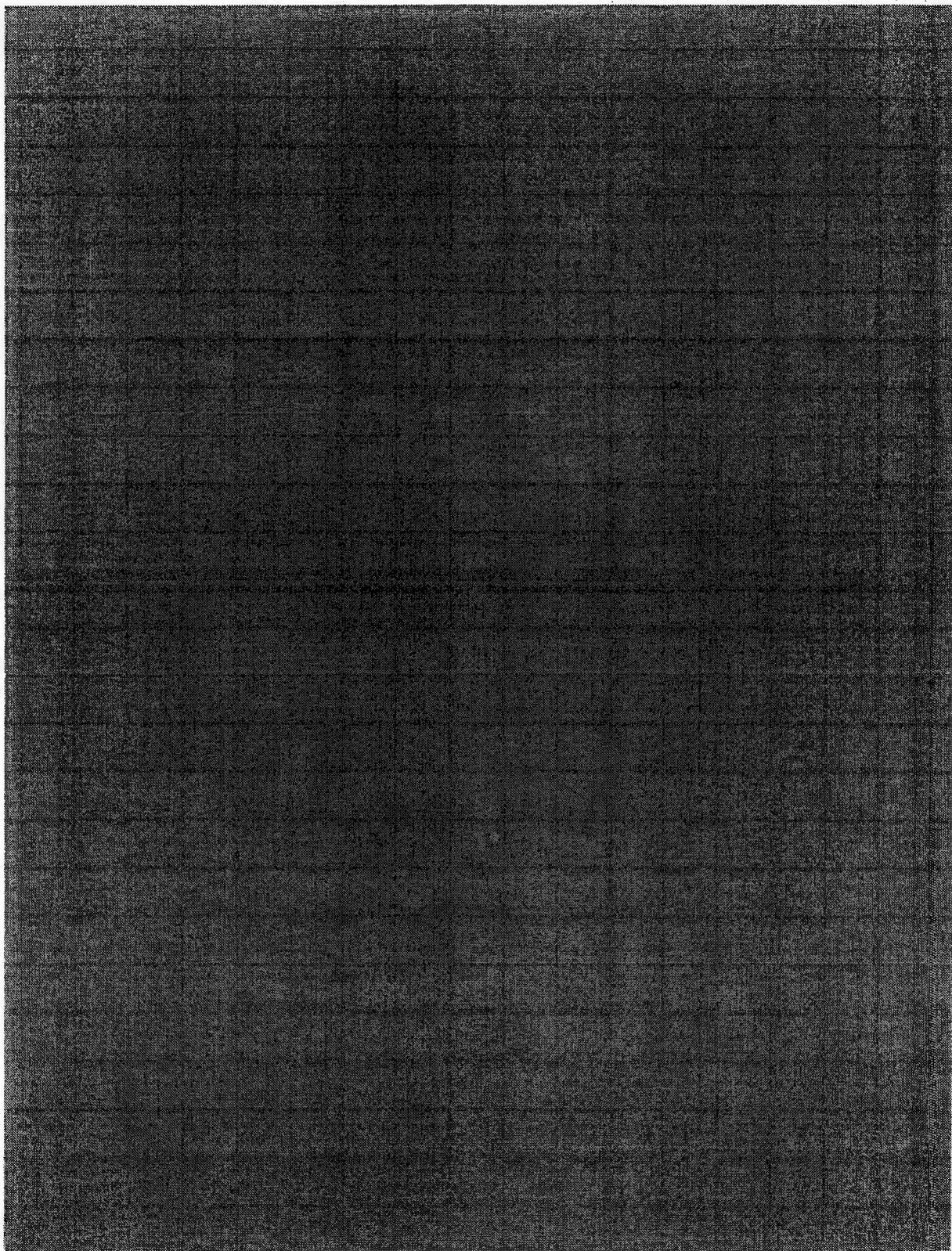
KX-FLM600G

6.3 PRINT TEST PATTERN

(Reference pattern)

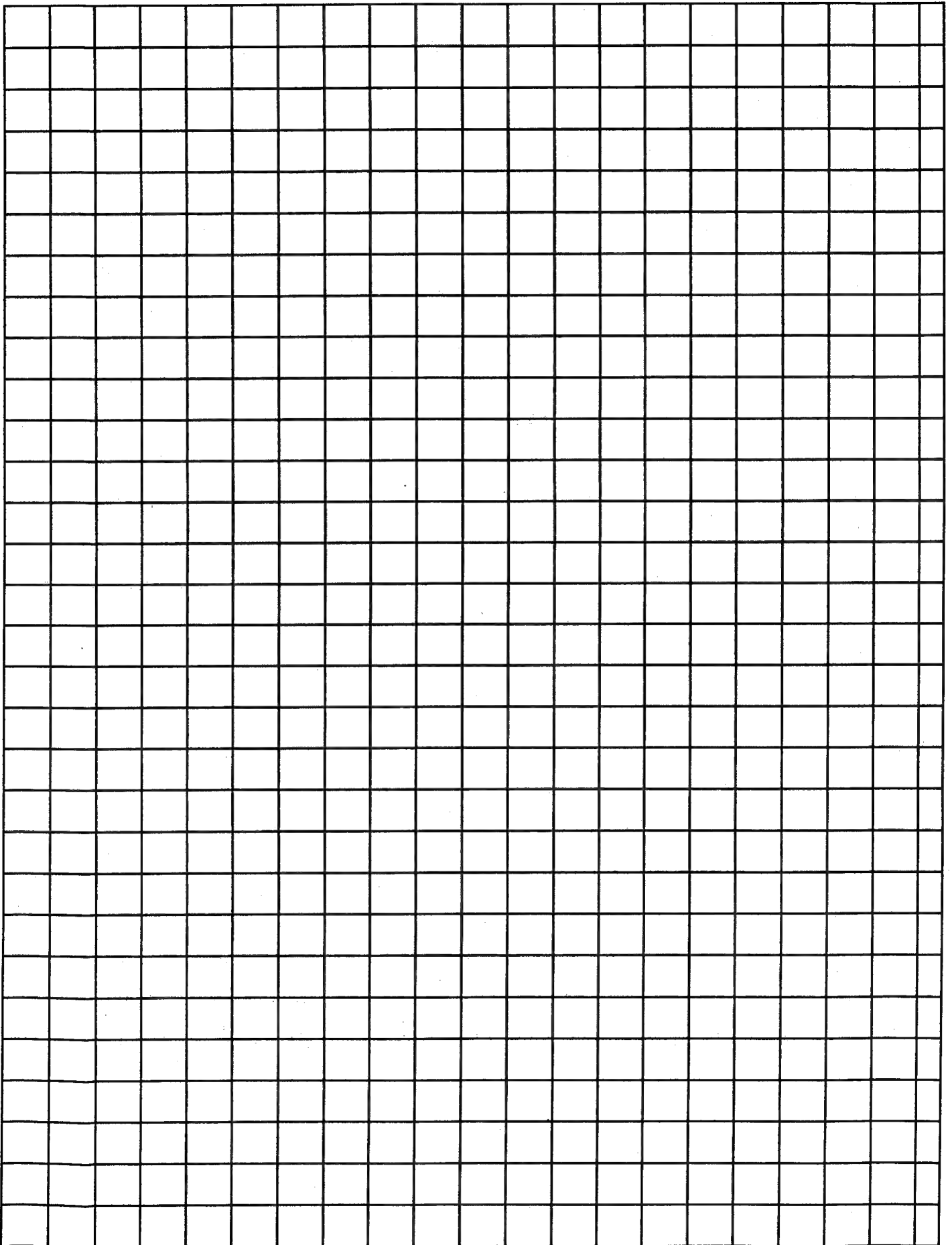


(Reference pattern)



TROUBLESHOOTING GUIDE

(Reference pattern)



MEMO

ADJUSTMENT

1. Shading : 137~142
2. High Voltage Value Check. 143, 144

1. SHADING

In the case as shown below, you should save the shading data.

- You replace the printer control board.
- You replace the CIS unit.

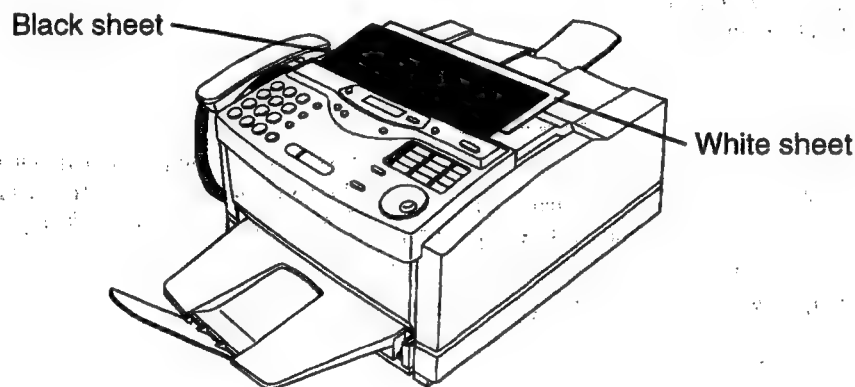
How to save the shading data

At first, you cut the shading sheets included in Service Manual.(page 139,141)

There are 2 sheets, white and black.

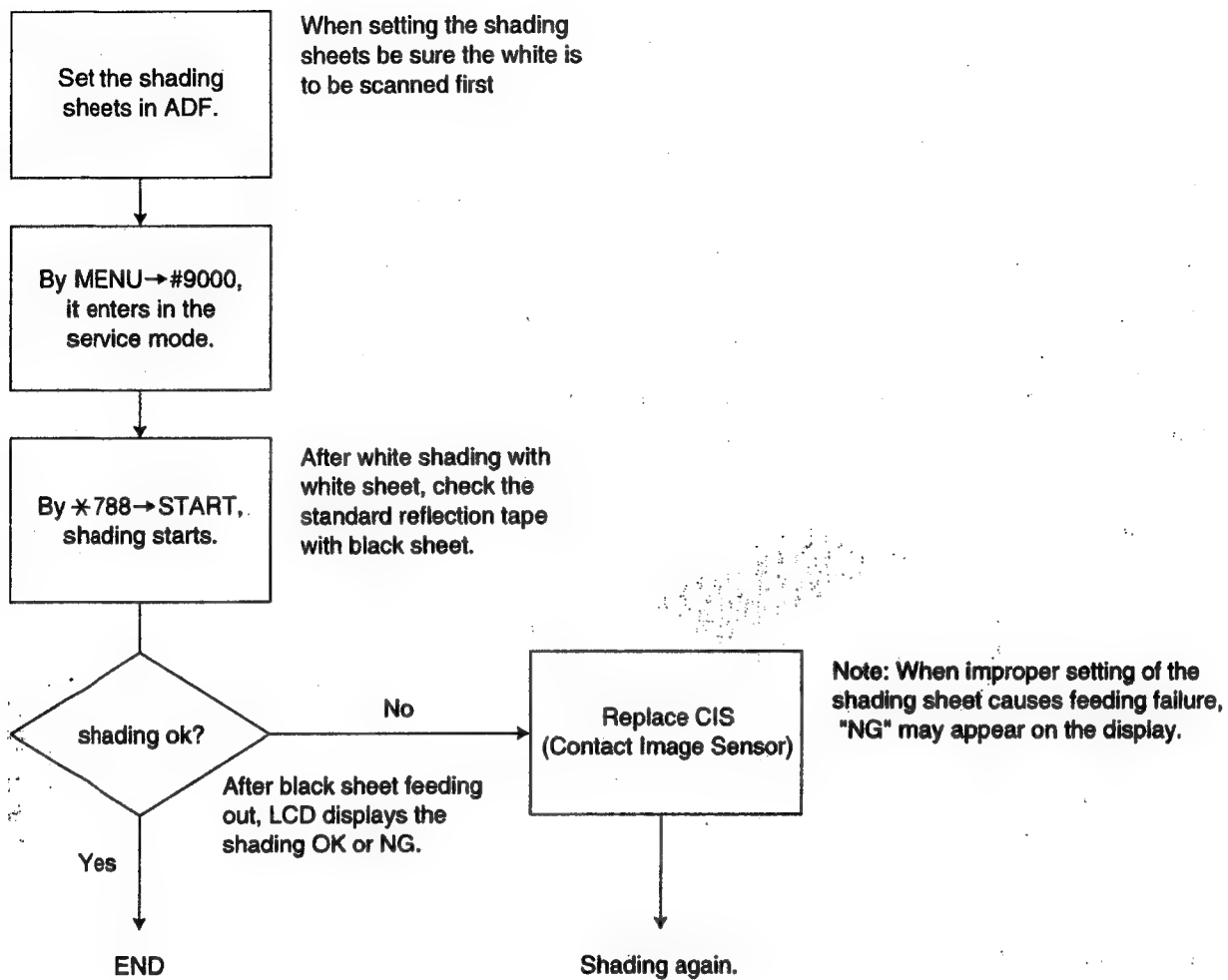
Insert these sheets in ADF. In this time, you must set the white sheet is under the black sheet.

Then, you enter the service mode 788, start shading.

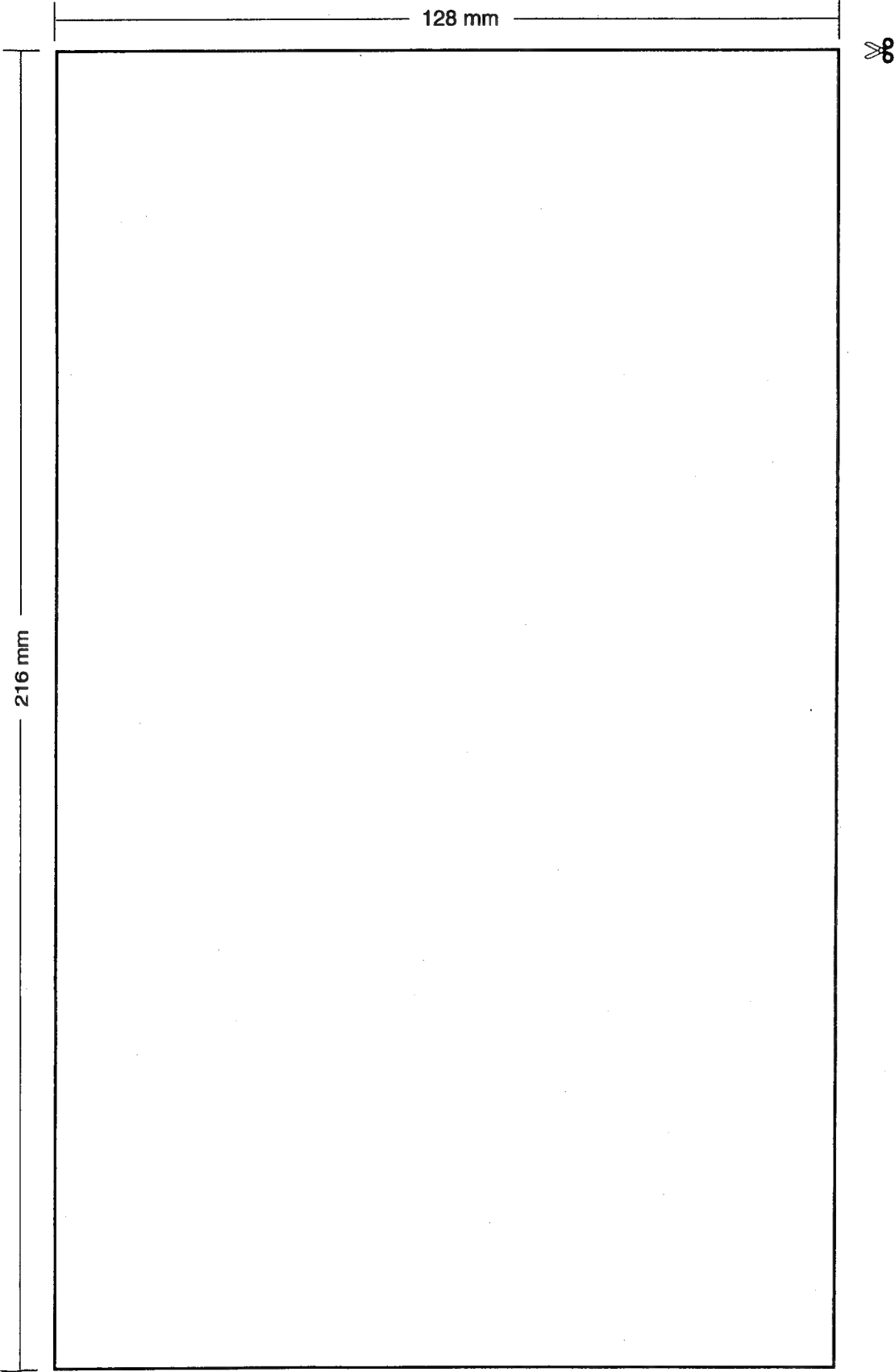


After the end of shading, If the LCD displayed "SHADING NG" ; Check the white tape position that is stuck the end of CIS.

If the tape is inside, replace the tape to outside.



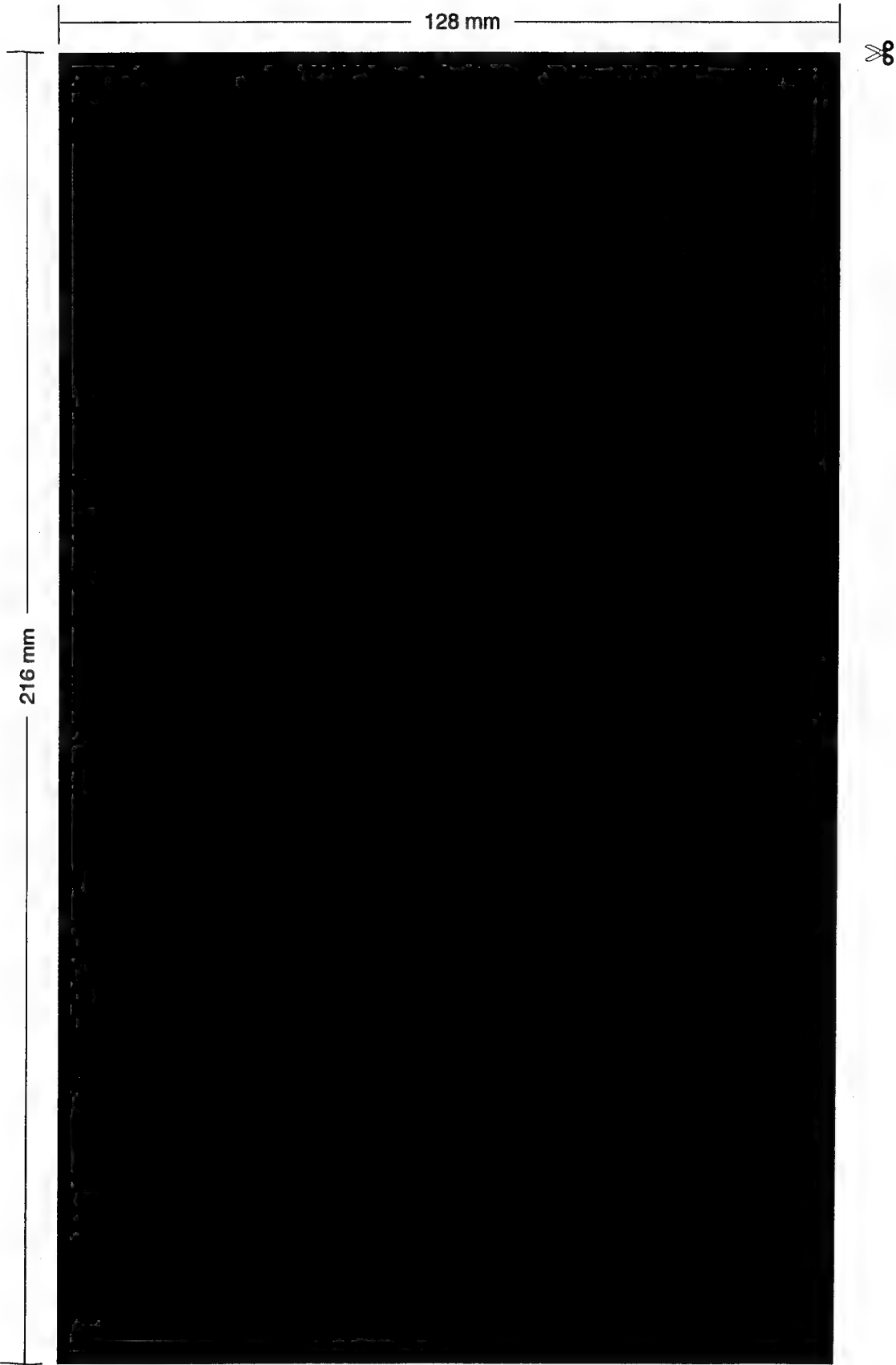
Shading Sheet (1)



ADJUSTMENT

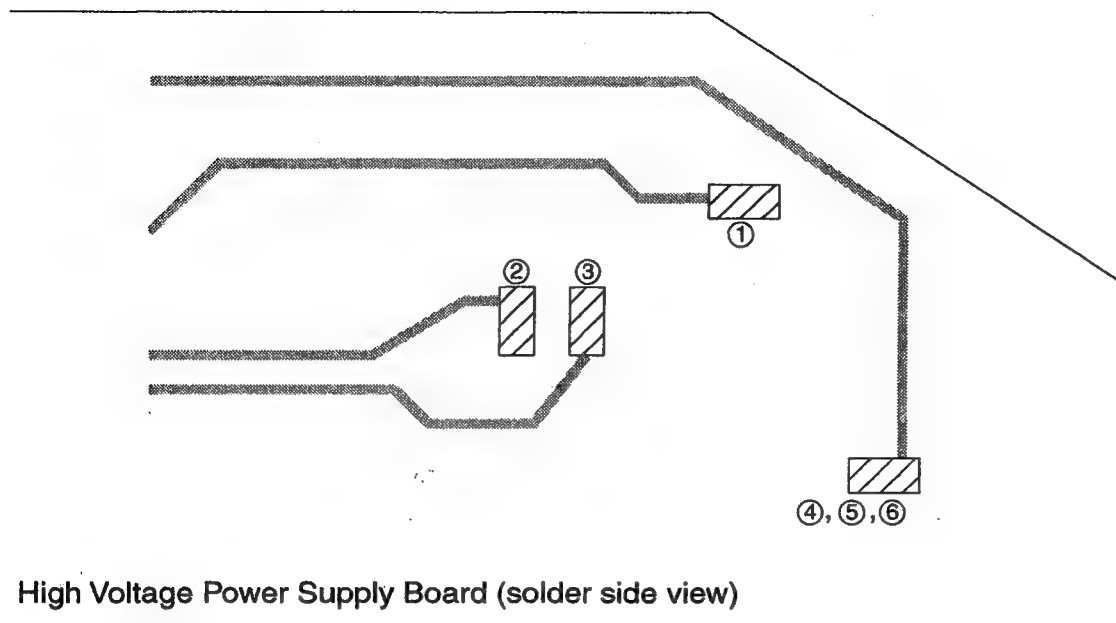
KX-FLM600G

Shading Sheet (2)



ADJUSTMENT

2. High Voltage Value Check Point



No.	BIAS Name	VALUE	Check Timing
①	PR(Charging)	-1180V	Demo Print : After the MOTOR start to rotate.
②	CH(Supply)	-600V	Demo Print : After the MOTOR start to rotate.
③	DE(Developing)	-350V	Demo Print : After the MOTOR start to rotate.
④	RTR(Cleaning)	-870V	Demo Print : After the recording paper is started to feed.
⑤	TR(Transfer)	+600 ~ +2.3kV *	Demo Print : After the recording paper is started to eject.
⑥	TR(Transfer)	+11 μ A	Manual Feed Print : After the recording paper is started to eject.

* This voltage changes according to paper kind.

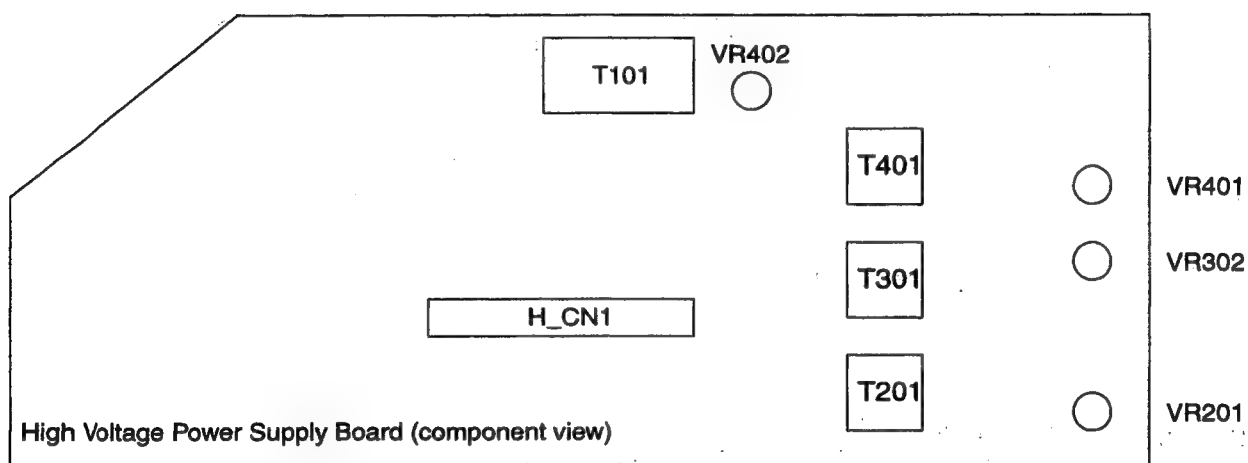
Measuring Instruments

- ① ~ ⑤ : High Voltage Probe
⑥ : Multimeter(μ A range)

*NOTE: Insert the multimeter between J5,J6 on HVPS board and TRANSFER terminal.

How to adjust the high voltage value

When you replace any parts, you should check the high voltage value.
If that value isn't correct, adjust it by using the volume resistor.
Refer to the following chart.



BIAS	DEFAULT VALUE	ADJUSTMENT POINT
PR	-1200V±5%	VR201
CH	-600V±5%	VR302
DE	-350V±5%	VR302
RTR	-850V±5%	VR401
TR	11μA±5%	VR402

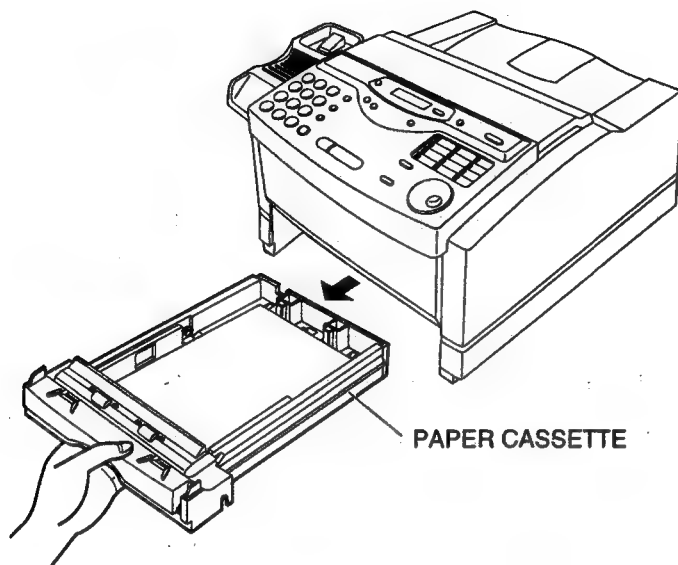
DISASSEMBLY INSTRUCTIONS

1. How to remove the Paper Cassette,the Printer Controller board,
the Digital Board and the Analog Board 146
2. How to remove the Drum Unit and Toner Cartridge 147
3. How to remove the Main Case 148
4. How to remove the LSU Unit 149
5. How to remove the Operation Panel Block/ Sub Frame Block 149
6. How to remove the Power Supply Unit 150
7. How to remove the Motor Block 151
8. How to remove the High Voltage Power Supply Board 152
9. How to remove the Pick up Ass'y 153
10. How to remove the Engine Board 153,154
11. How to separate the Operation Panel Block
From Sub Frame Block 155
12. How to remove the Heat Roller Block 155
13. How to remove the Heat Roller 156
14. How to remove the Transfer Roller Block 157
15. How to remove the Rollers 157
16. How to remove the Image Sensor and White Roller 158
17. How to Remove the Operation Board 159
18. How to Remove the Handset Cradle Block and the Hook Board ... 160

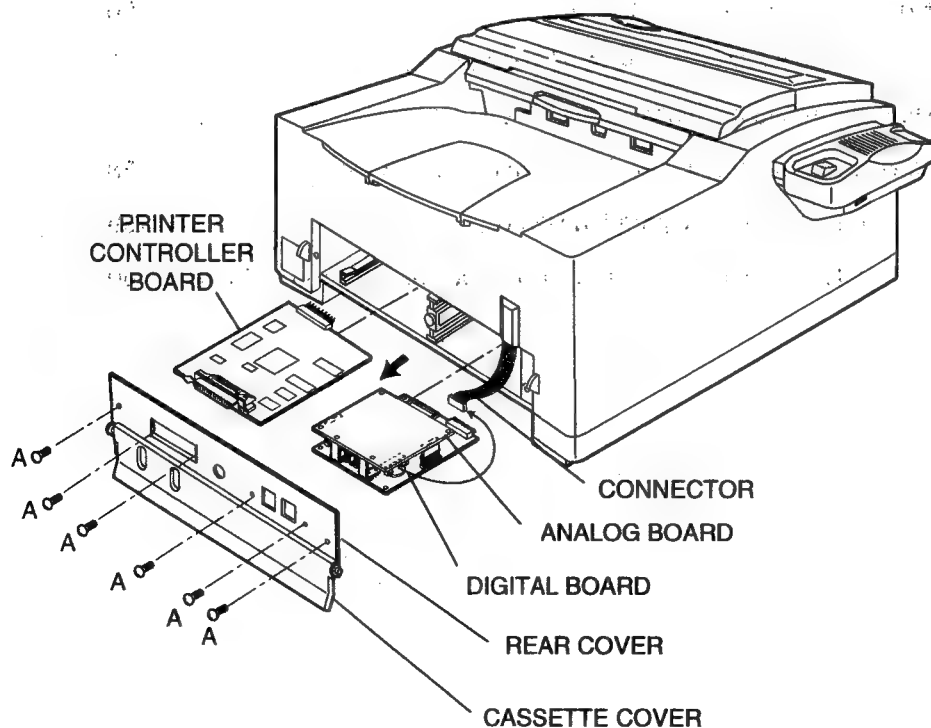
Ref. No. 1

HOW TO REMOVE THE PAPER CASSETTE ,THE PRINTER CONTROLLER BOARD, THE DIGITAL BOARD AND THE ANALOG BOARDProcedure
1

- 1) Remove the paper cassette.



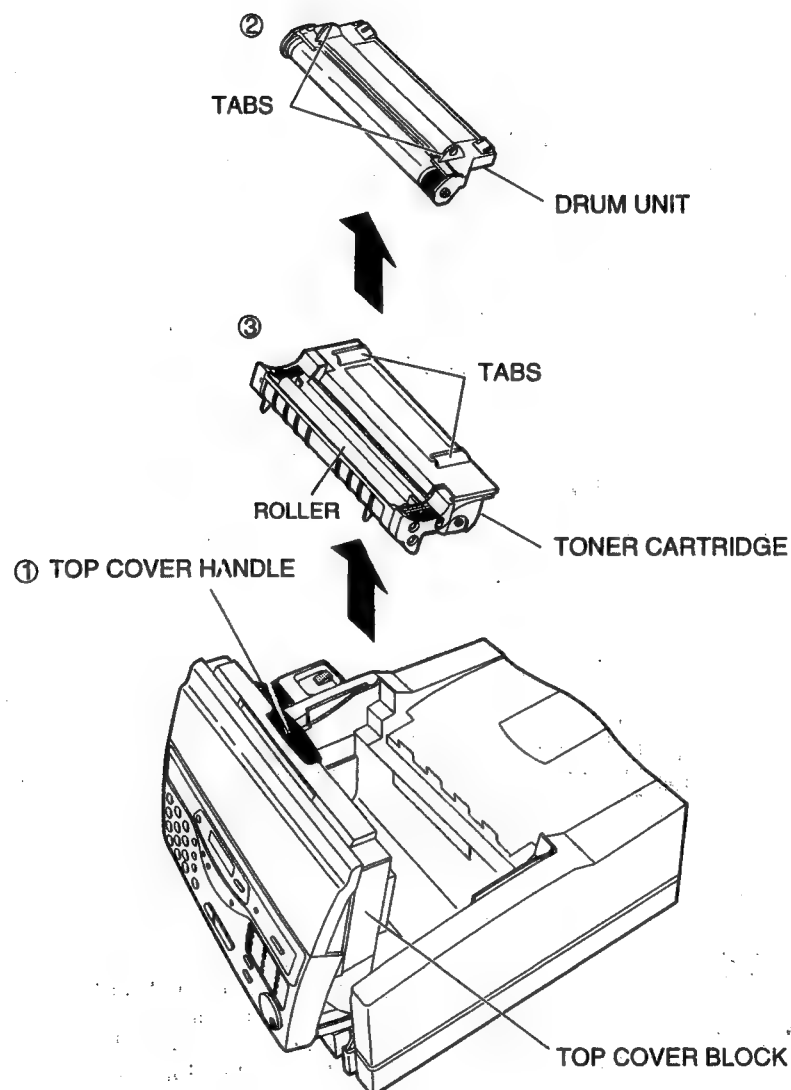
- 2) Remove the 6 screws (A), then remove the rear cover and the cassette cover.
3) Disconnect the connector, then pull out the digital / analog board and the Printer controller board in the direction indicated by the arrow in the diagram.



Ref. No. 2

HOW TO REMOVE THE DRUM UNIT AND THE TONER CARTRIDGE.Procedure
2

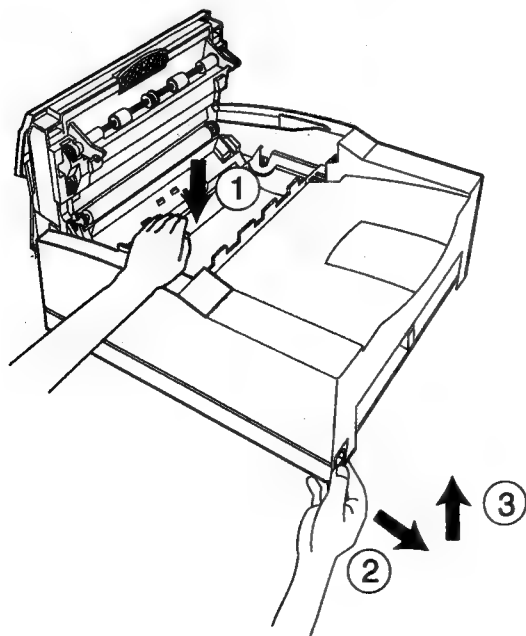
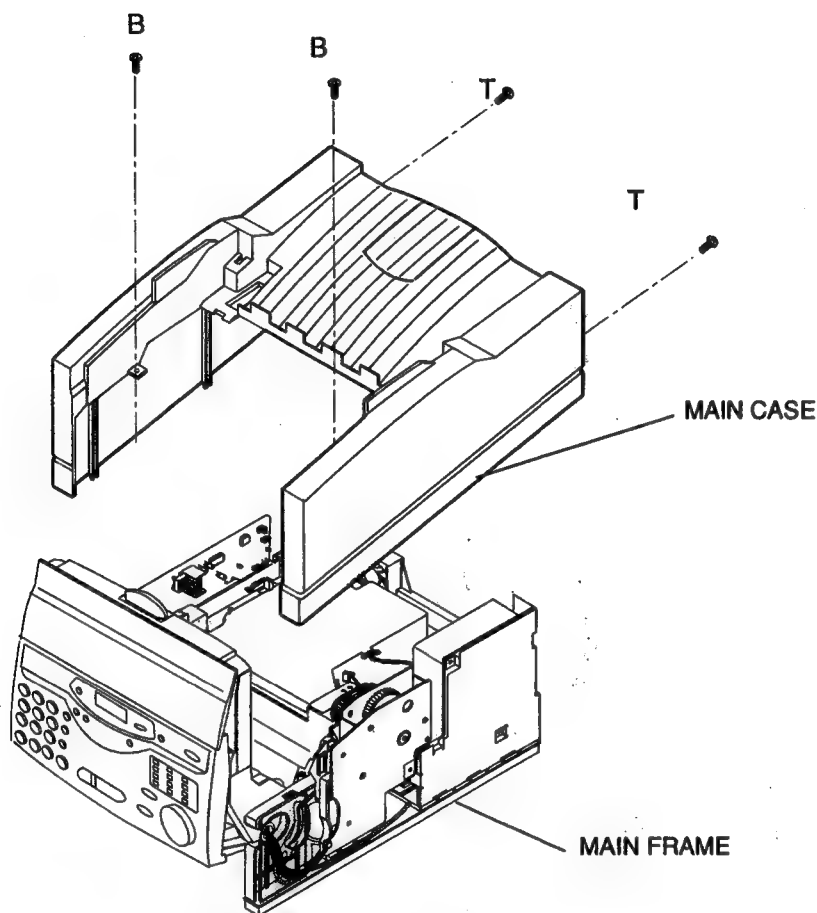
- 1) ① Push the top cover handle and pull open the top cover block.
- 2) ② Remove the drum unit by holding the two tabs.
- 3) ③ Remove the toner cartridge by holding the two tabs.



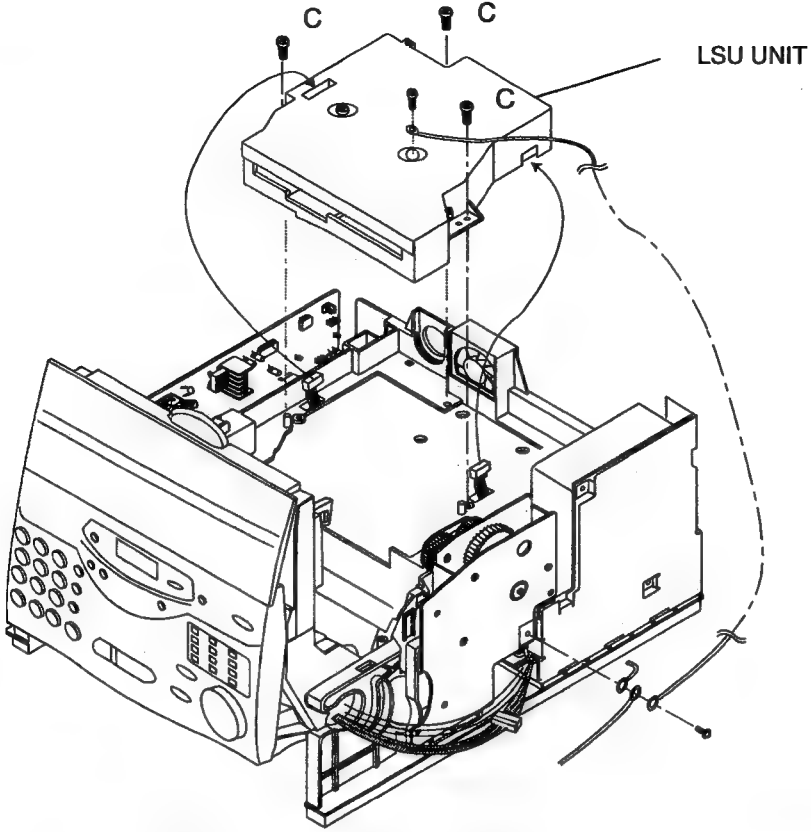
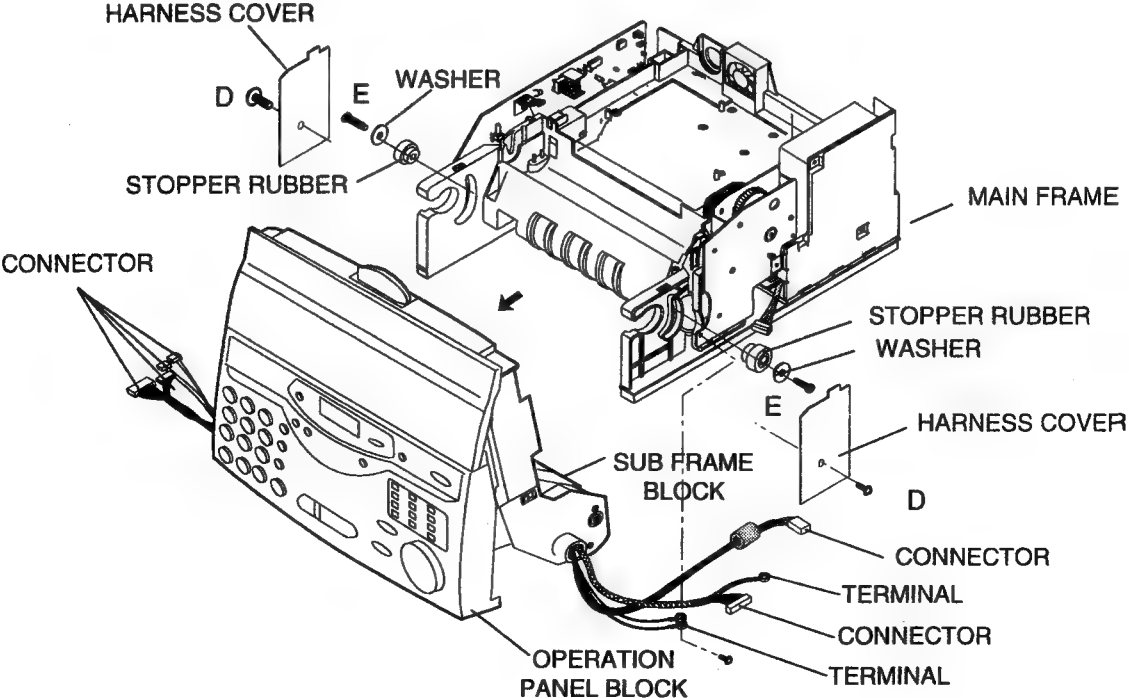
Ref. No. 3

HOW TO REMOVE THE MAIN CASEProcedure
2→3

- 1) Push the cover open button and pull open the operation panel block/ sub frame block.
- 2) Remove the 2 screws (B) and the 2 screws (T), then remove the main case.



As shown below, while pushing down on the main frame with one hand in the direction indicated by arrow (1), pull the main case with your other hand backward in the direction of arrow (2) and then upward in the direction of arrow (3).

Ref. No. 4	HOW TO REMOVE THE LSU UNIT
Procedure 2→3→4	1) Remove the 3 screws (C), then remove the LSU unit.
	
Ref. No. 5	HOW TO REMOVE THE OPERATION PANEL BLOCK / SUB FRAME BLOCK
Procedure 2→3→5	1) As shown below, remove the 1 screw (D) on each side, then remove both harness covers. 2) Disconnect all the connectors and terminals between the sub frame and the main frame. 3) Remove the screw (E), washer and stopper rubber on both sides of the main frame. 4) Pull out the operation cover / sub frame in the direction of the arrow shown in the diagram.
	

Ref. No. 6

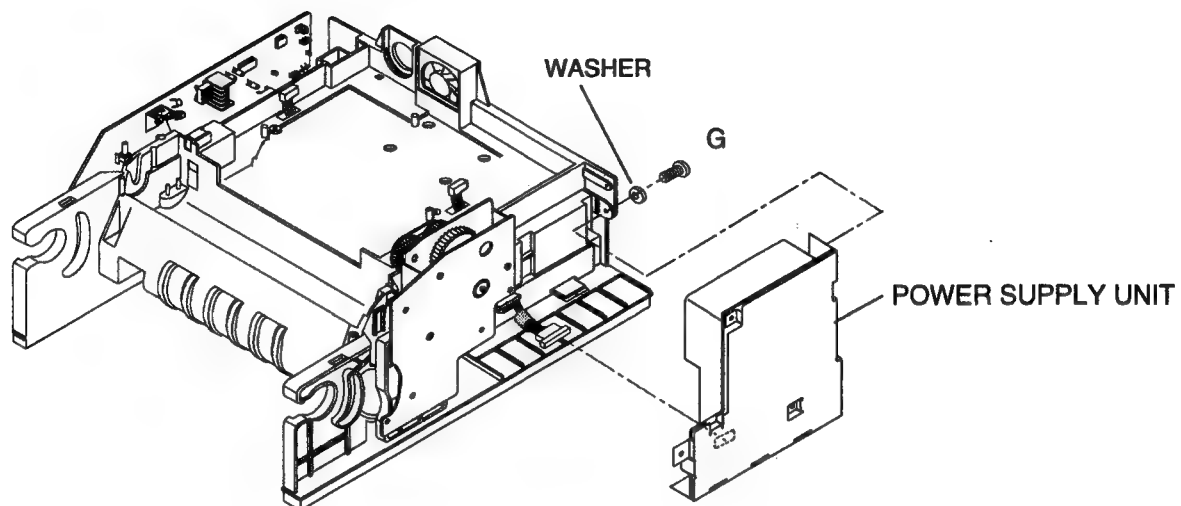
HOW TO REMOVE THE POWER SUPPLY UNIT

Procedure

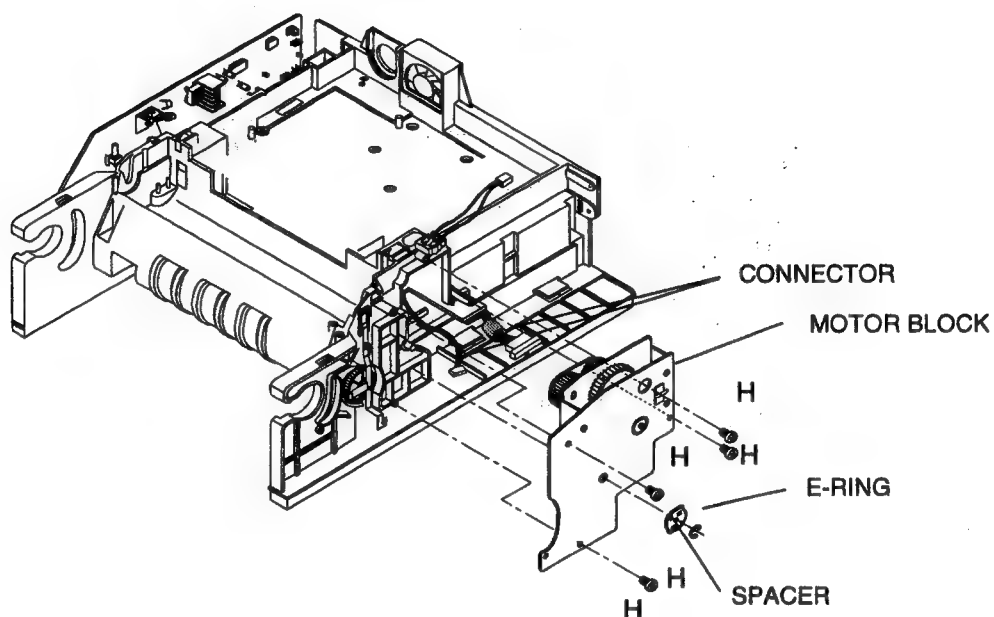
2→3→5

→6

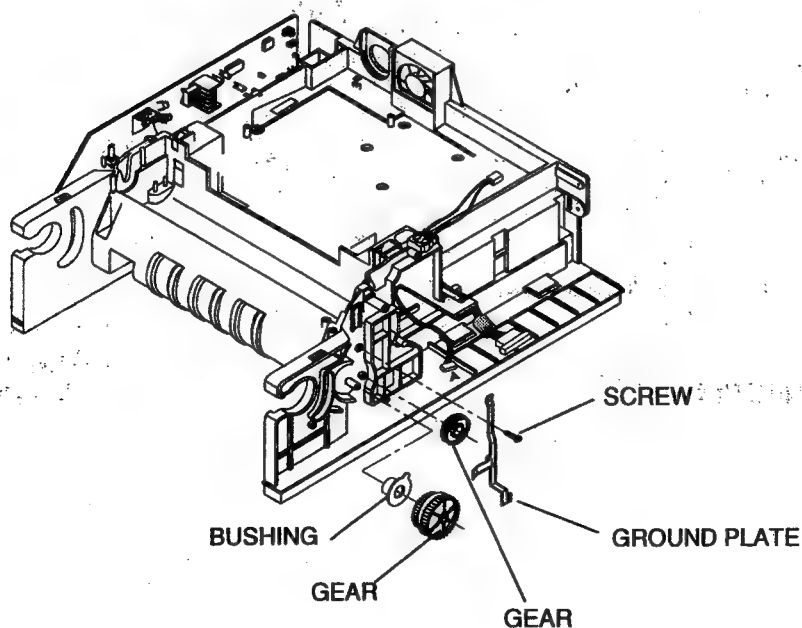
1) Remove the 1 screw (G) and washer, then remove the power supply unit.



Ref. No. 7	HOW TO REMOVE THE MOTOR BLOCK
Procedure 2→3→5 →6→7	1) Remove the 4 screws (H), E-ring and spacer, disconnect the 2 connectors, and then remove the motor block.



2) Remove the Screw, ground plate, the 2 gears and the spacer.



Ref. No.8

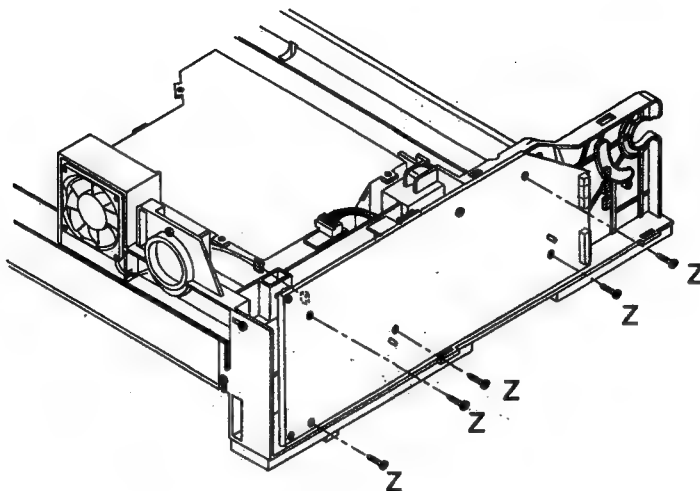
HOW TO REMOVE THE HIGH VOLTAGE POWER SUPPLY BOARD

Procedure

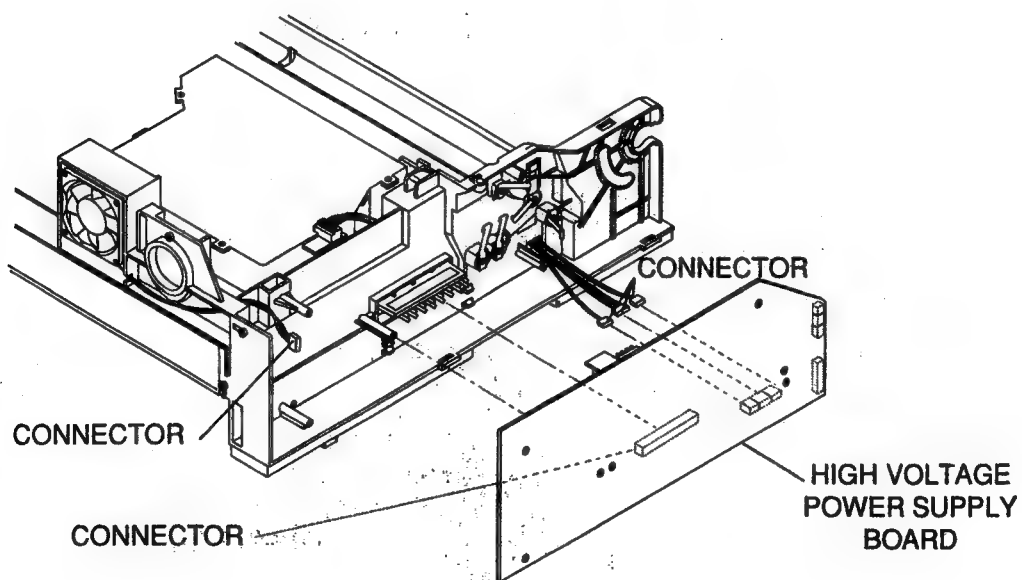
2→3→5

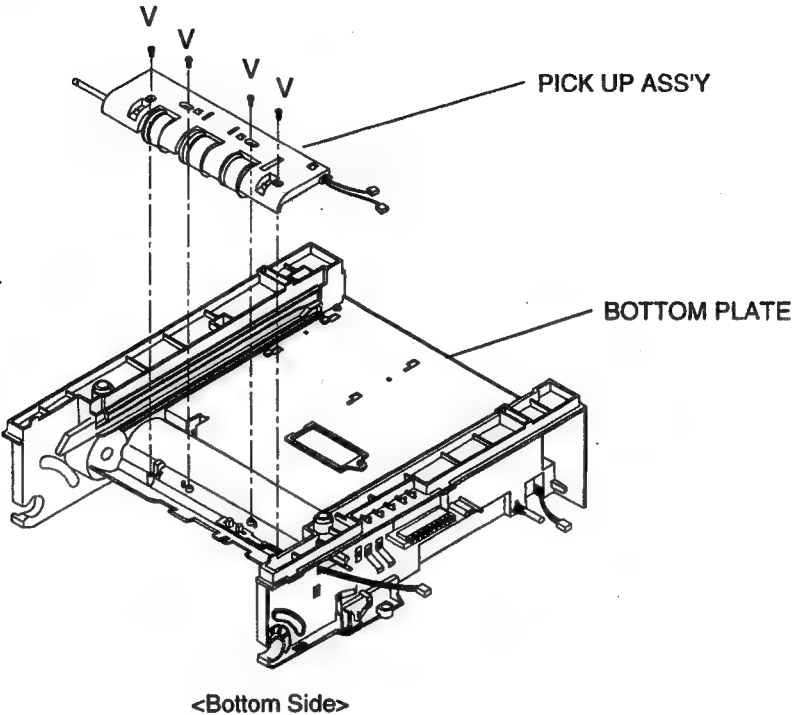
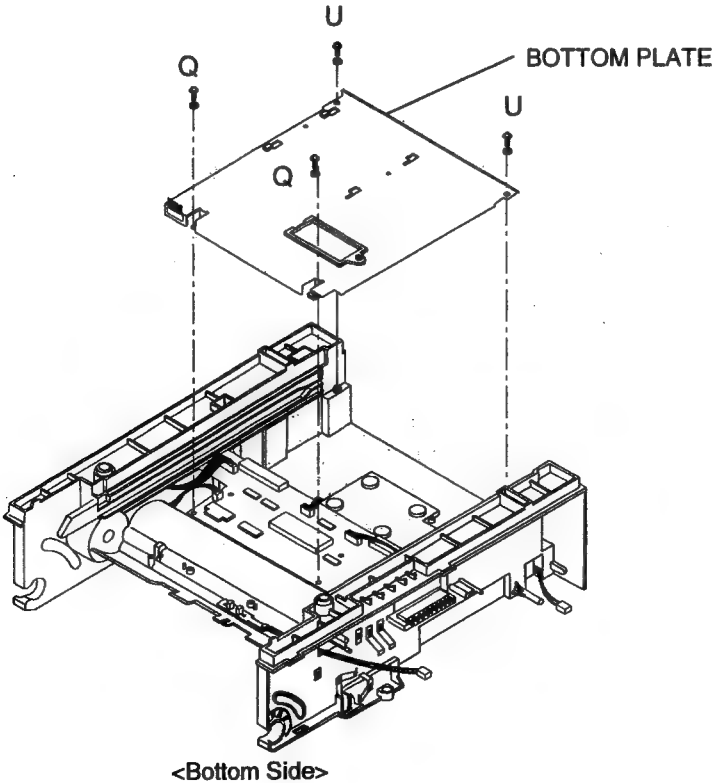
→8

1) Remove the 5 screws (Z).

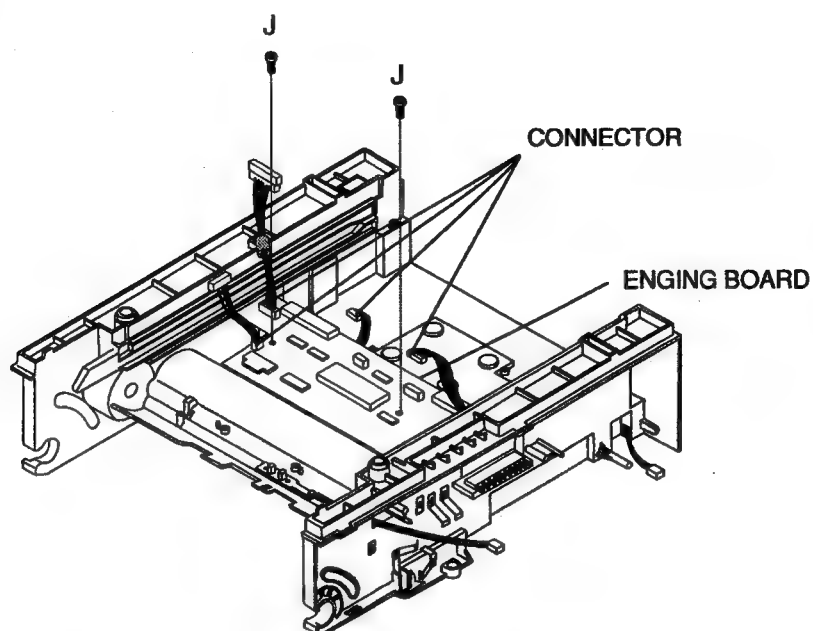


2) Disconnect the 5 connectors, then remove the high voltage power board.

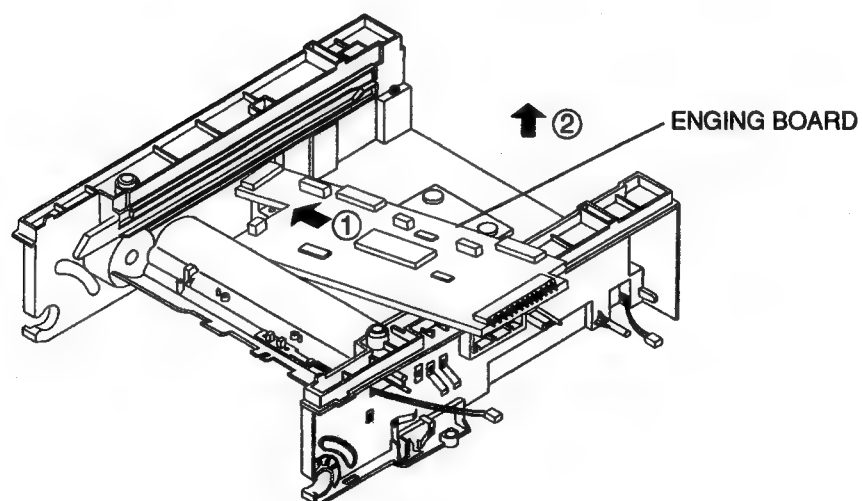


Ref. No9	<div>HOW TO REMOVE THE PICK UP ASS'Y</div>
<div> <div>Procedure</div> <div>2→3→5→</div> <div>7→8→9</div> </div>	<div>1) Remove the 4 screws (V), then remove the pick up assembly.</div> <div>  <p><Bottom Side></p> </div>
Ref. No. 10	<div>HOW TO REMOVE THE ENGINE BOARD</div>
<div> <div>Procedure</div> <div>2→3→5</div> <div>8→10</div> </div>	<div>1) Remove the 2 screws (Q)and the 2 screws (U), then remove the bottom plate.</div> <div>  <p><Bottom Side></p> </div>

2) Remove the 2 screws (J) and disconnect the 4 connectors.



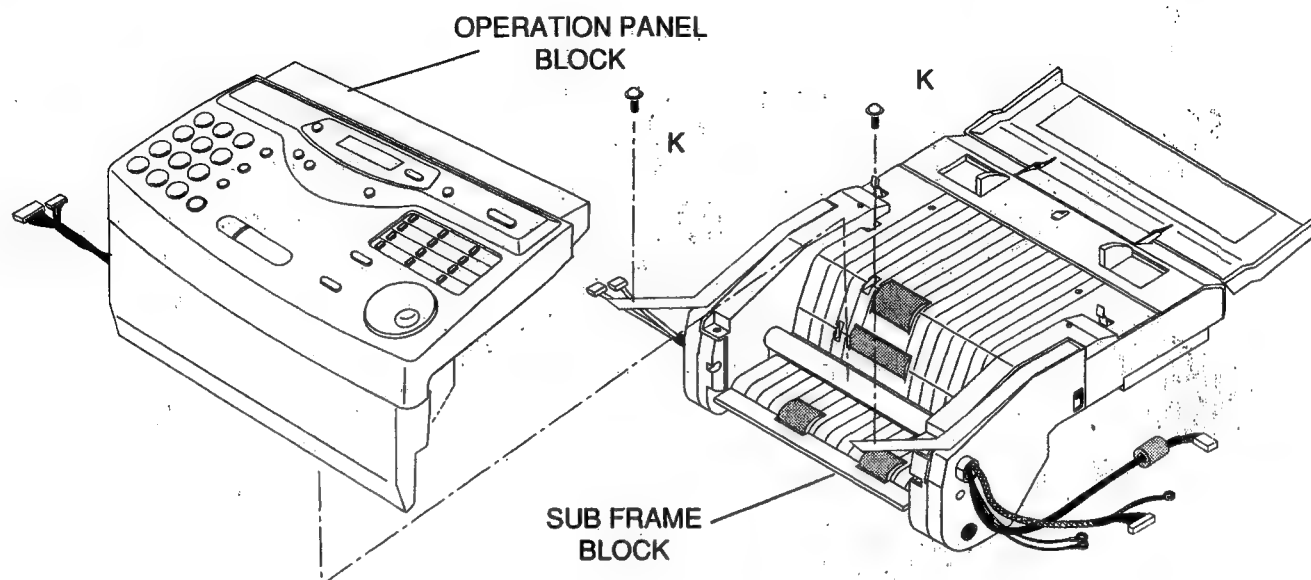
3) Push the engine board in the direction of arrow (1), then lift it up in the direction of arrow (2).



Ref. No. 11

HOW TO SEPARATE THE OPERATION PANEL BLOCK FROM SUB FRAME BLOCKProcedure
2→3→11

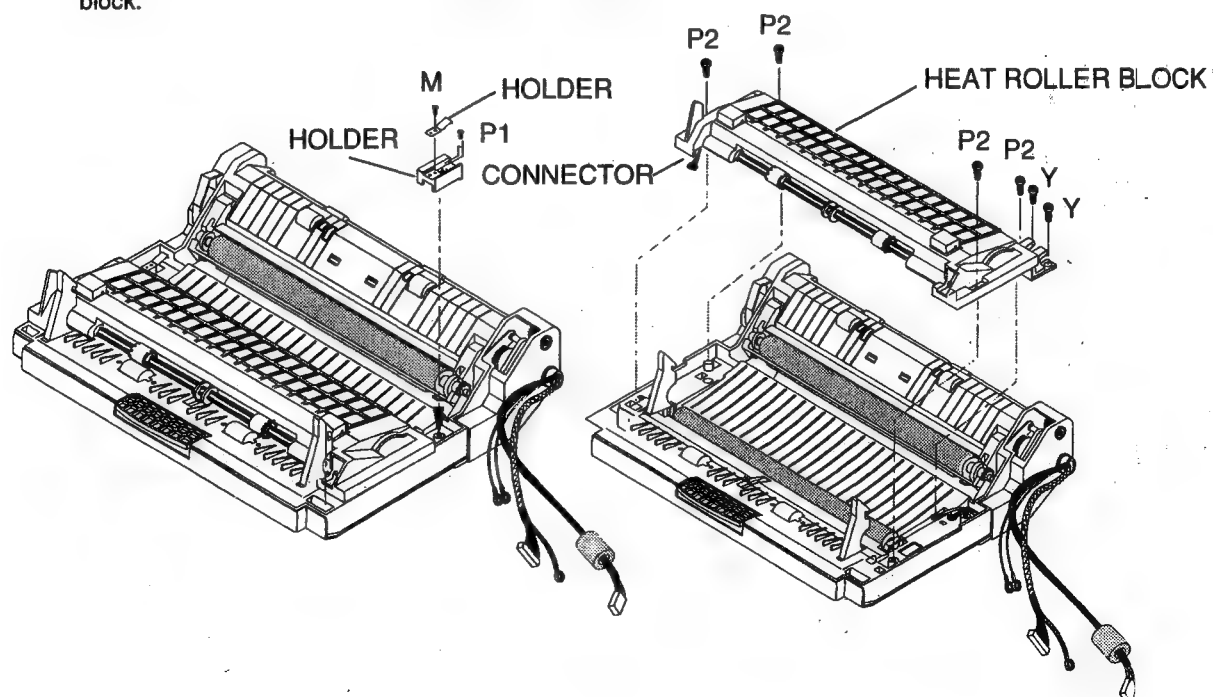
- 1) Remove the 2 screws (K), then remove the operation panel block from the sub frame block.



Ref. No. 12

HOW TO REMOVE THE HEAT ROLLER BLOCKProcedure
2→3→11
→12

- 1) Remove the 1 screw (M) and 2 screws (P1), then remove the holder and plate.
2) Remove the 4 screws (P2), 2 screws (Y) and disconnect the connector, then remove the heat roller block.



Ref. No.13

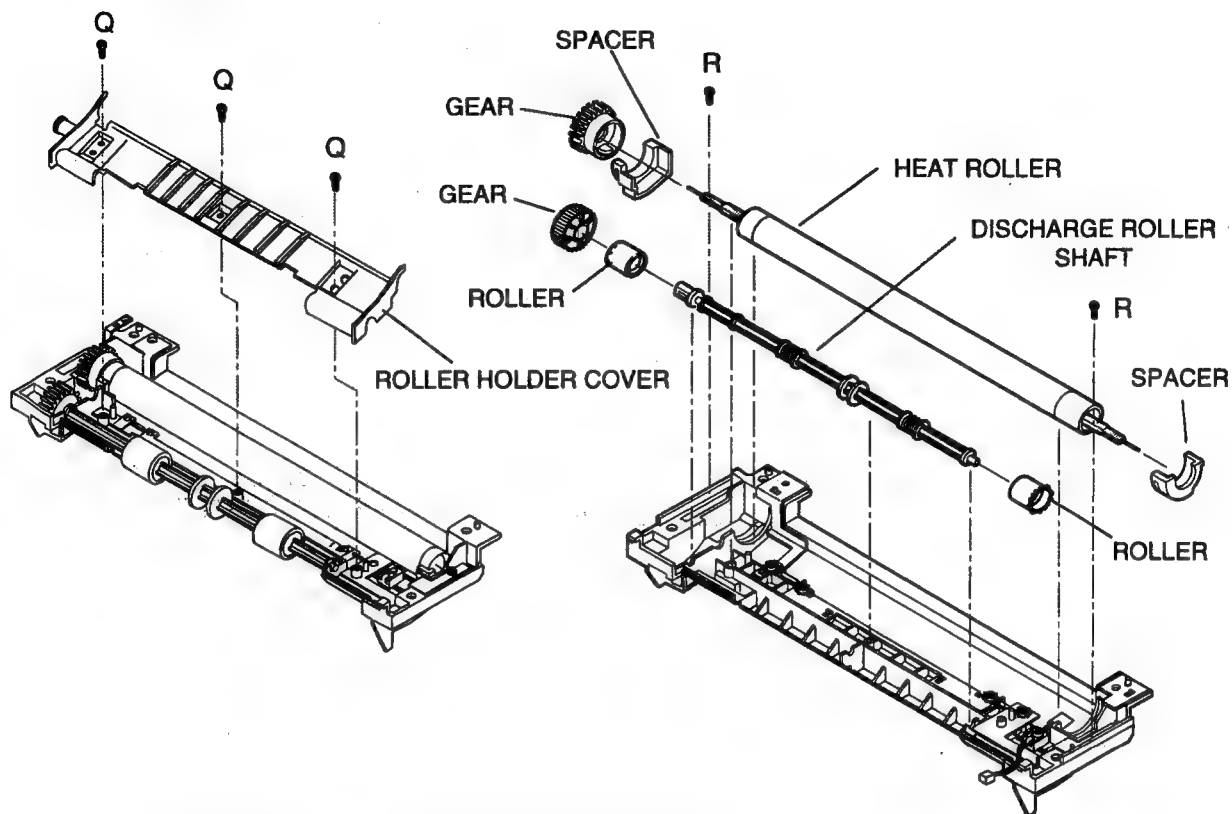
HOW TO REMOVE THE HEAT ROLLER

Procedure

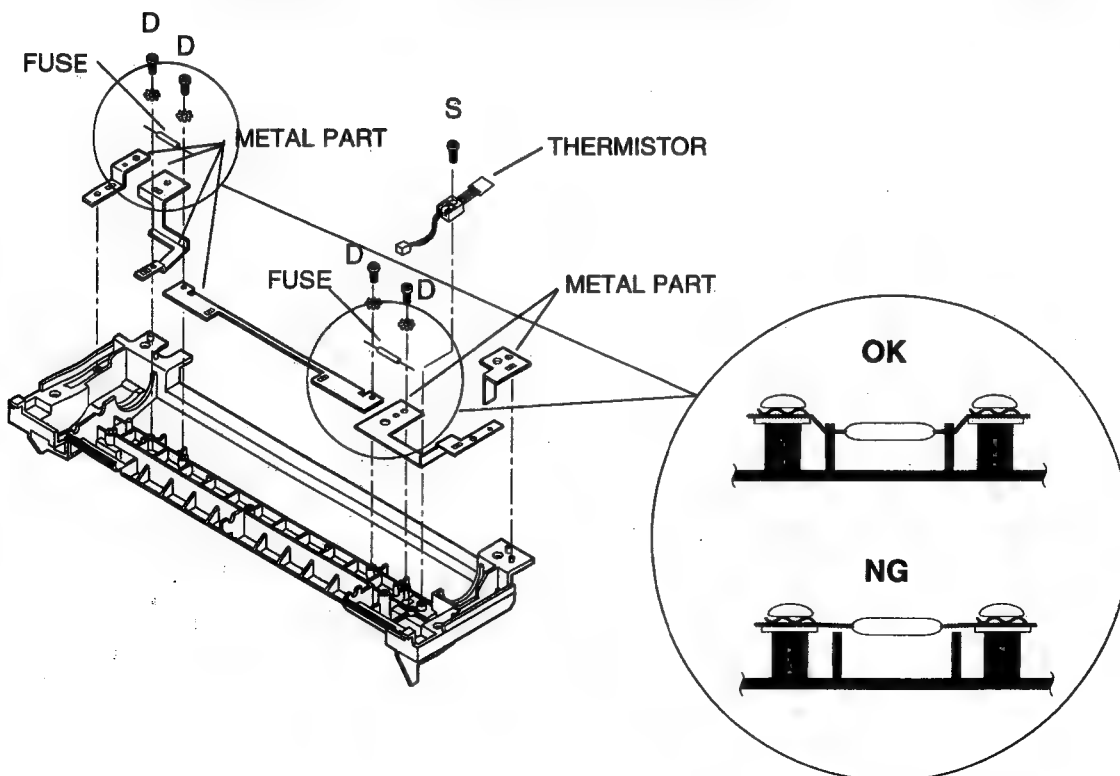
2→3→11

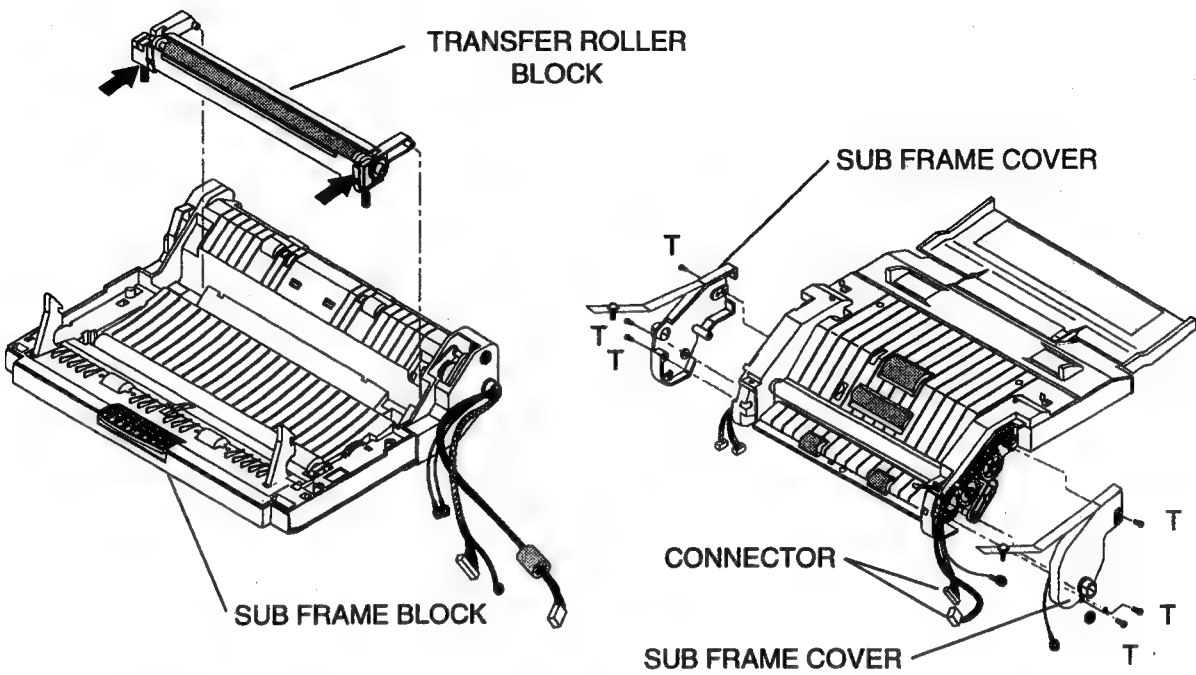
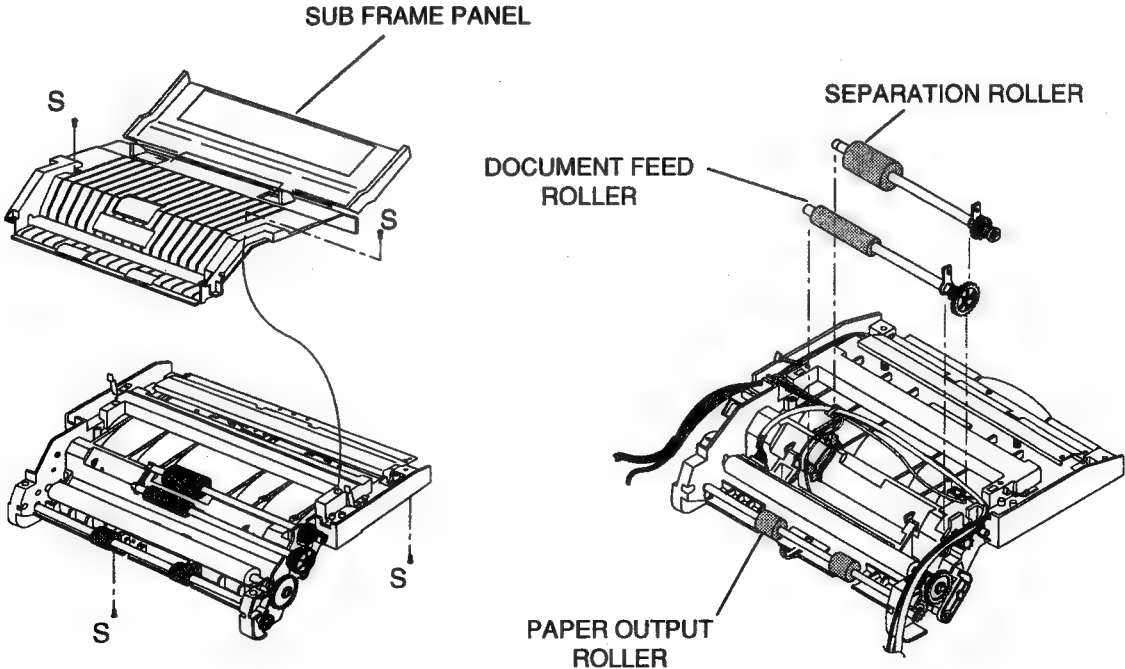
→12→13

- 1) Remove the 3 screws (Q), then remove the roller holder cover.
- 2) Remove the discharge roller, two rollers and a gear.
- 3) Remove the 2 screws (R), then remove the heat roller, then remove the spacers and a gear



- 4) Remove the 1 screw (S), then remove the thermistor.
- 5) Remove the 4 screws and washers (D), then remove the two fuses and the metal parts.



Ref. No. 14	HOW TO REMOVE THE TRANSFER ROLLER BLOCK
Procedure 2→3→7→12 →13→14	1) Press the catches in the direction indicated by the arrows, then lift up the transfer roller block. 2) Remove the 6 screws (T) and disconnect the connectors, then remove the sub frame cover from both sides.
	 <p>TRANSFER ROLLER BLOCK</p> <p>SUB FRAME BLOCK</p> <p>SUB FRAME COVER</p> <p>CONNECTOR</p> <p>SUB FRAME COVER</p>
Ref. No. 15	HOW TO REMOVE THE ROLLERS
Procedure 2→3→5→ 11→12→13 →14→15	1) Remove the 4 screws (S), then remove the sub frame panel. 2) Remove the document feed roller and separation roller.
	 <p>SUB FRAME PANEL</p> <p>SEPARATION ROLLER</p> <p>DOCUMENT FEED ROLLER</p> <p>PAPER OUTPUT ROLLER</p>

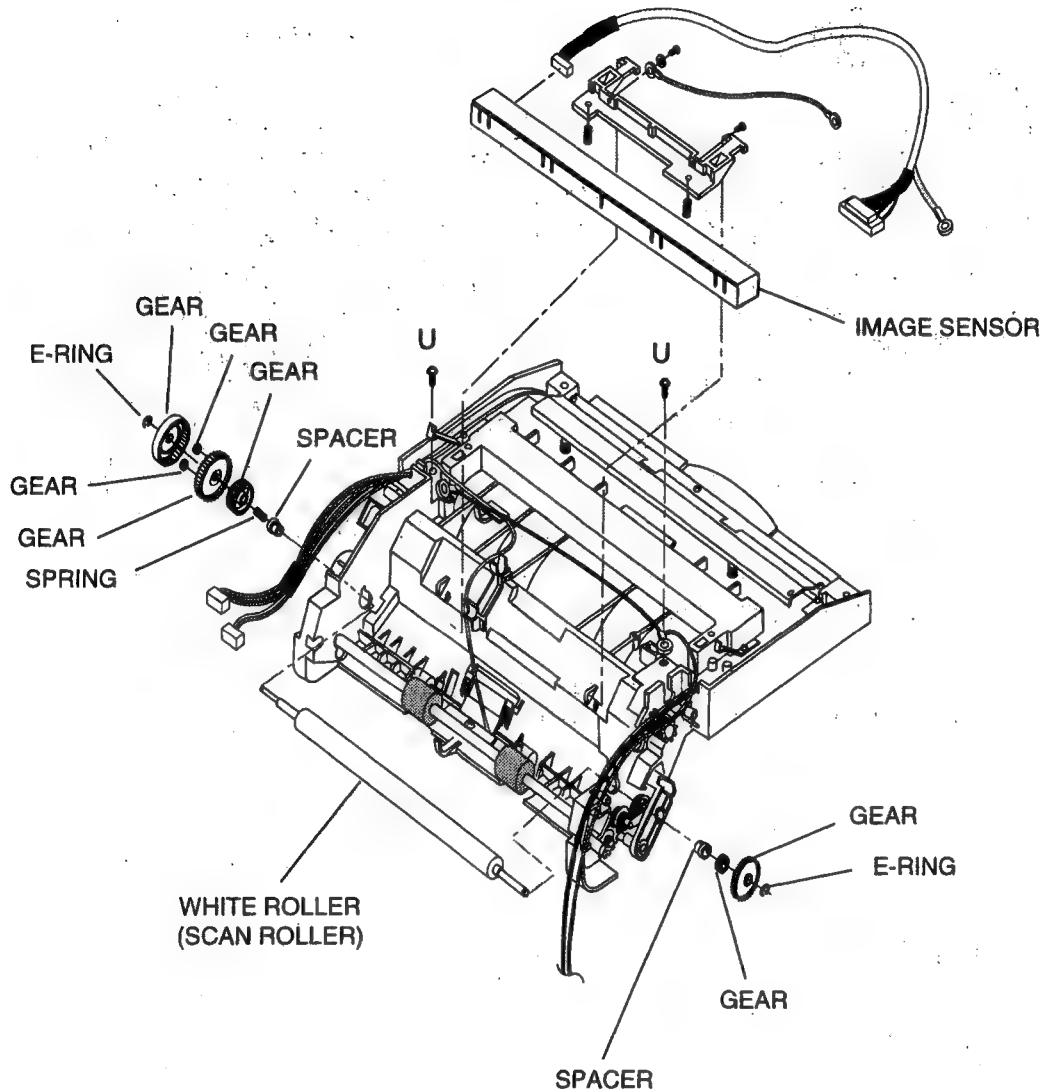
Ref. No. 16

HOW TO REMOVE THE IMAGE SENSOR AND WHITE ROLLER (SCAN ROLLER)

Procedure

2→3→7→12
→13→14→
15→16→17

- 1) Remove the E-ring, gears, spring and spacer on each sides, then remove the reading roller.
- 2) Remove the image sensor.

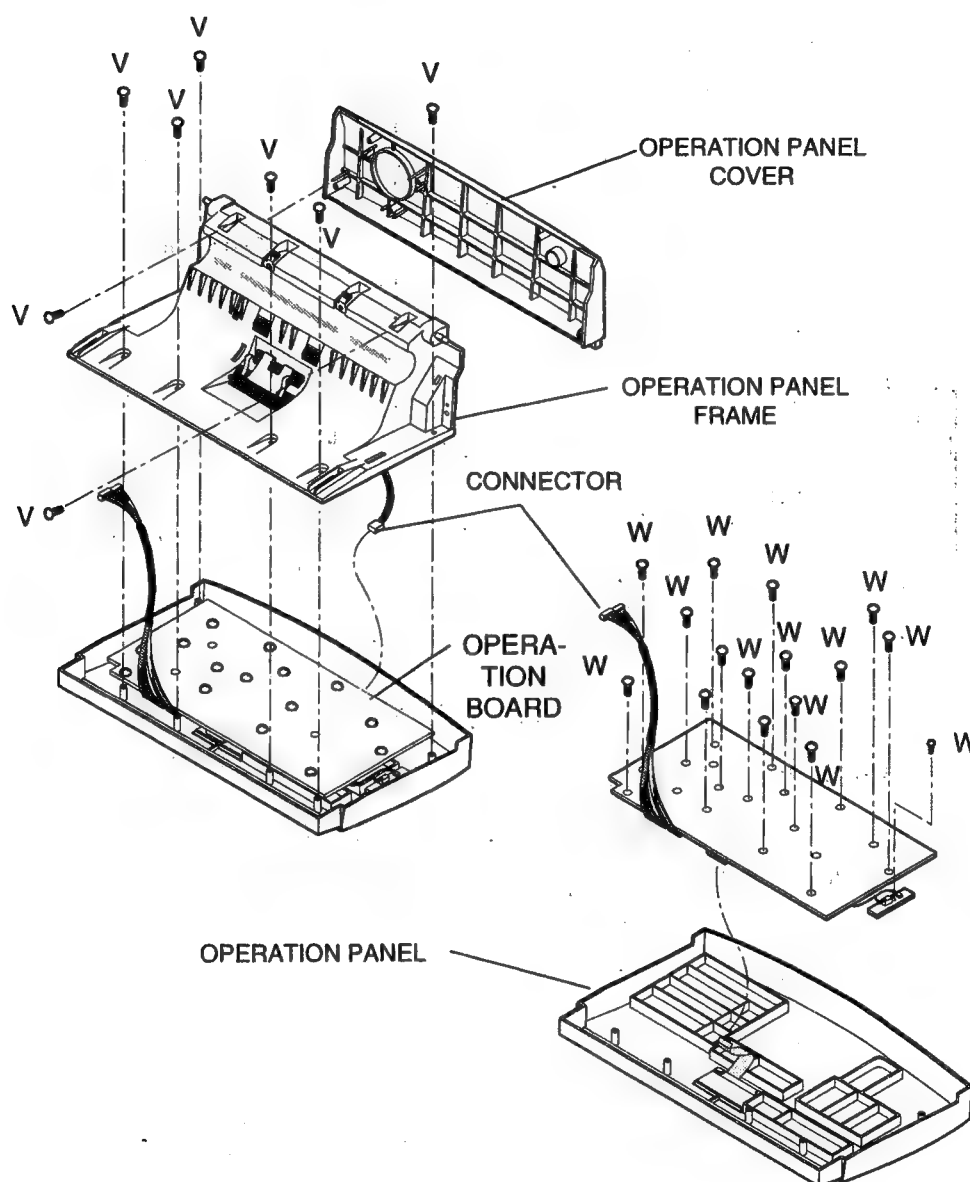


Ref. No. 16

HOW TO REMOVE THE OPERATION BOARD

Procedure
2→3→11
→17

- 1) Remove the 8 screws (V), then remove the operation panel cover from the operation panel frame.
- 2) Remove the 16 screws (W) and disconnect the 2 connectors, then remove the operation board.

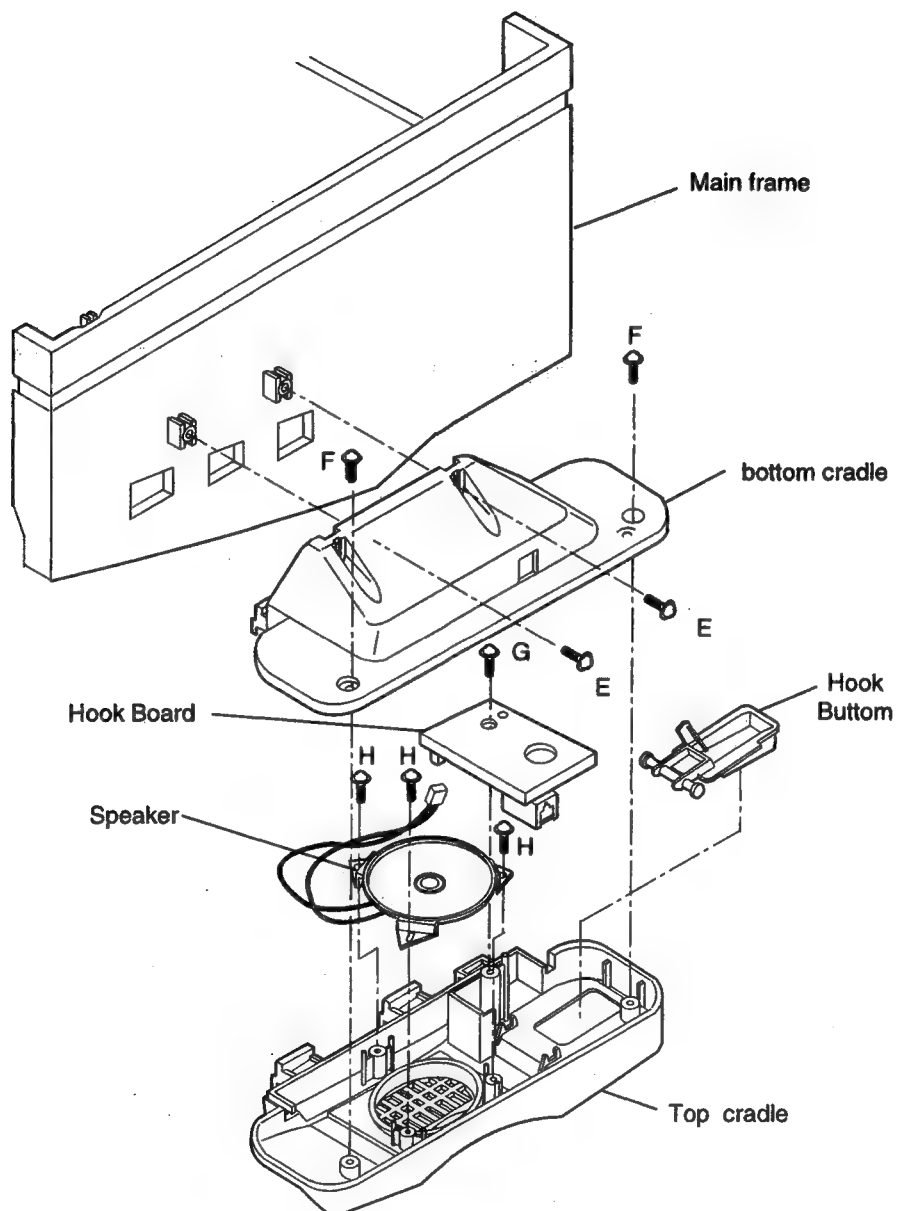


Ref. No. 18

HOW TO REMOVE THE HANDSET CRADLE BLOCK AND THE HOOK BOARD

Procedure
18

- 1) Remove the 2 screws (E), then remove the handset cradle block.
- 2) Remove the 2 screws (F), then remove the top cradle from the bottom cradle.
- 3) Remove the 1 screw (G), then remove the hook board and the hook bottom.
- 4) Remove the 3 screw (H), then remove the speaker.



HOW TO REPLACE THE FLAT PACKAGE IC

If you do not have the special tools (for example, SPOT HEATER) to remove the SPOT HEATER'S Flat IC, if you have solder (large amount), a soldering iron and cutter knife, you can easily remove the ICs even if there are more than 100 pins.

1. PREPARATION

- SOLDER - - - - - Sparkle Solder 115A-1, 115B-1
OR
Almit Solder KR-19, KR-19RMA
- Soldering iron - - - - - Recommended power consumption is between 30 W to 40 W.
Temperature of Copper Rod $662 \pm 50^{\circ}\text{F}$ ($350 \pm 10^{\circ}\text{C}$)

(An expert may handle a 60~80 W iron, but a beginner might damage the foil by overheating.)
- Flux - - - - - HI115 Specific gravity 0.863

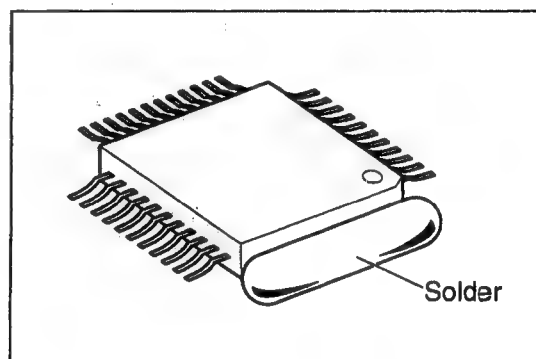
(Original flux should be replaced daily.)

2. FLAT PACKAGE IC REMOVAL PROCEDURE

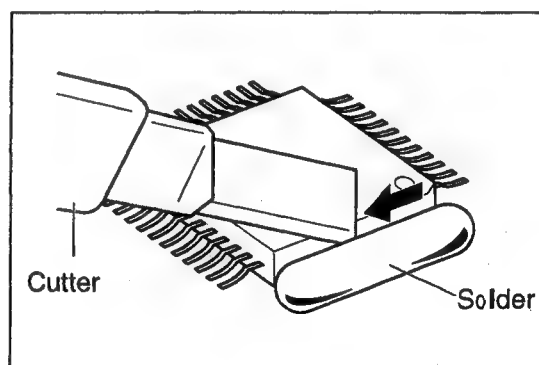
- 1) When all of the IC leads cannot be seen at the standard degree, fill with large quantities of solder.

Note:

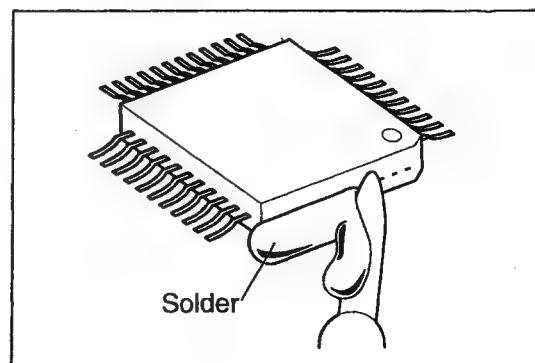
If you do not fill with solder and directly cut the IC lead with the cutter, stress may build up directly in the P.C. board's pattern. If you do not fill with large quantities of solder as in step 1, the P.C. board pattern may be removed.



- 2) Using a cutter, cut the lead at the source.
(Cut the contents with a cutter lightly, 5 or 6 times.)

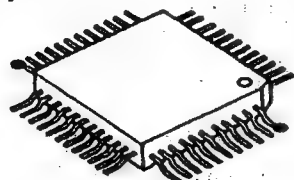


- 3) Remove when the solder melts.
(Remove the lead at the same time.)



After removing the Flat IC and when attaching a new IC, remove any of the excess solder on the land using the soldering wire, etc. If the excess solder is not removed from the land, the IC will slip and not be attached properly.

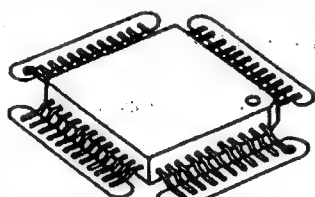
- 1) Temporarily fix the FLAT PACKAGE IC by soldering on the two marked pins.



● - - - - - Temporary soldering point.

*Check the accuracy of the IC setting with the corresponding soldering foil.

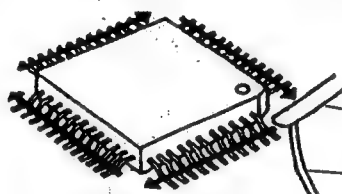
- 2) Apply flux to all pins of the FLAT PACKAGE IC.



○ - - - - - Flux

3. FLAT PACKAGE IC INSTALLATION PROCEDURE

- 3) Solder using the specified solder, in the direction of the arrow, by sliding the soldering iron.

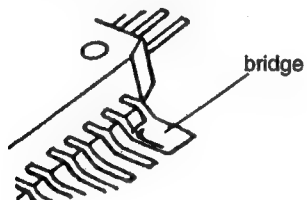


Soldering iron

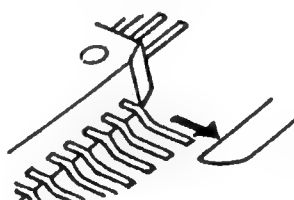
Specified solder

- 1) Lightly resolder the bridged portion.

- 2) Remove the remaining solder along the pins using a soldering iron as shown in the figure below.



bridge



LBP TECHNICAL PRINCIPLE

1. P.C.B.Location 164

2. Printer Operation Principle 165

3. Electric Operation Principle 166

4. Rollers Operation 167

5. Printing Operation Principle 169

 5.1. Paper Sensor 170

 5.2. Pickup Sensor 170

 5.3. Charging 171

 5.4. Exposing 171

 5.5. Developing 172

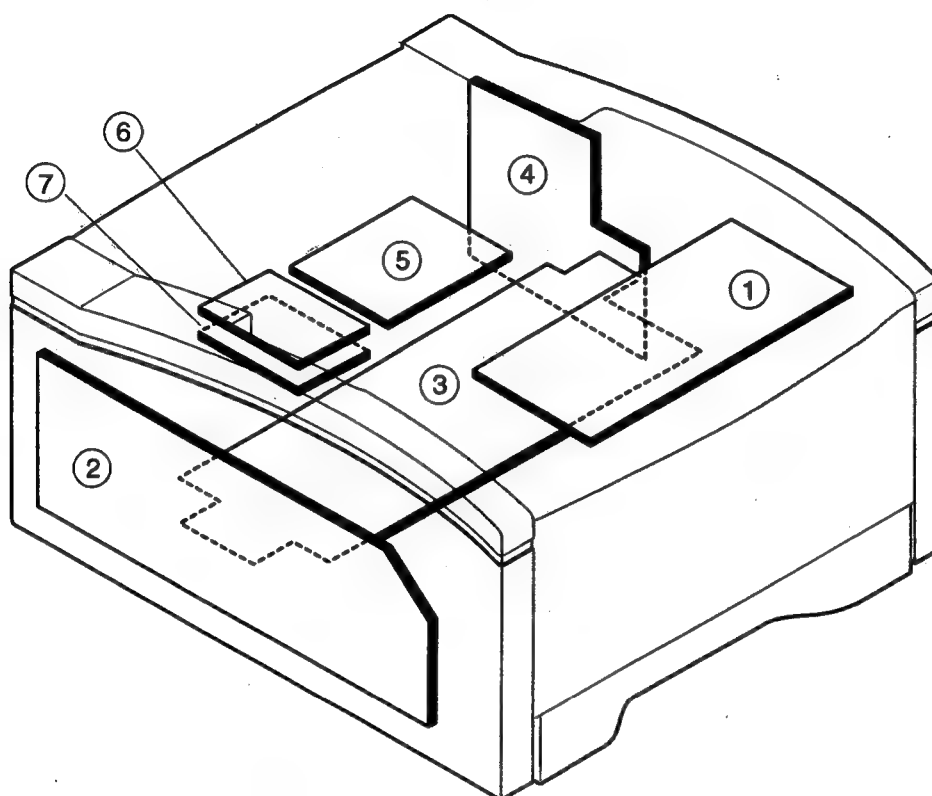
 5.6. Transcription 172

 5.7. Cleaning 173

 5.8. Fixing 173

 5.9. Image Reading 175

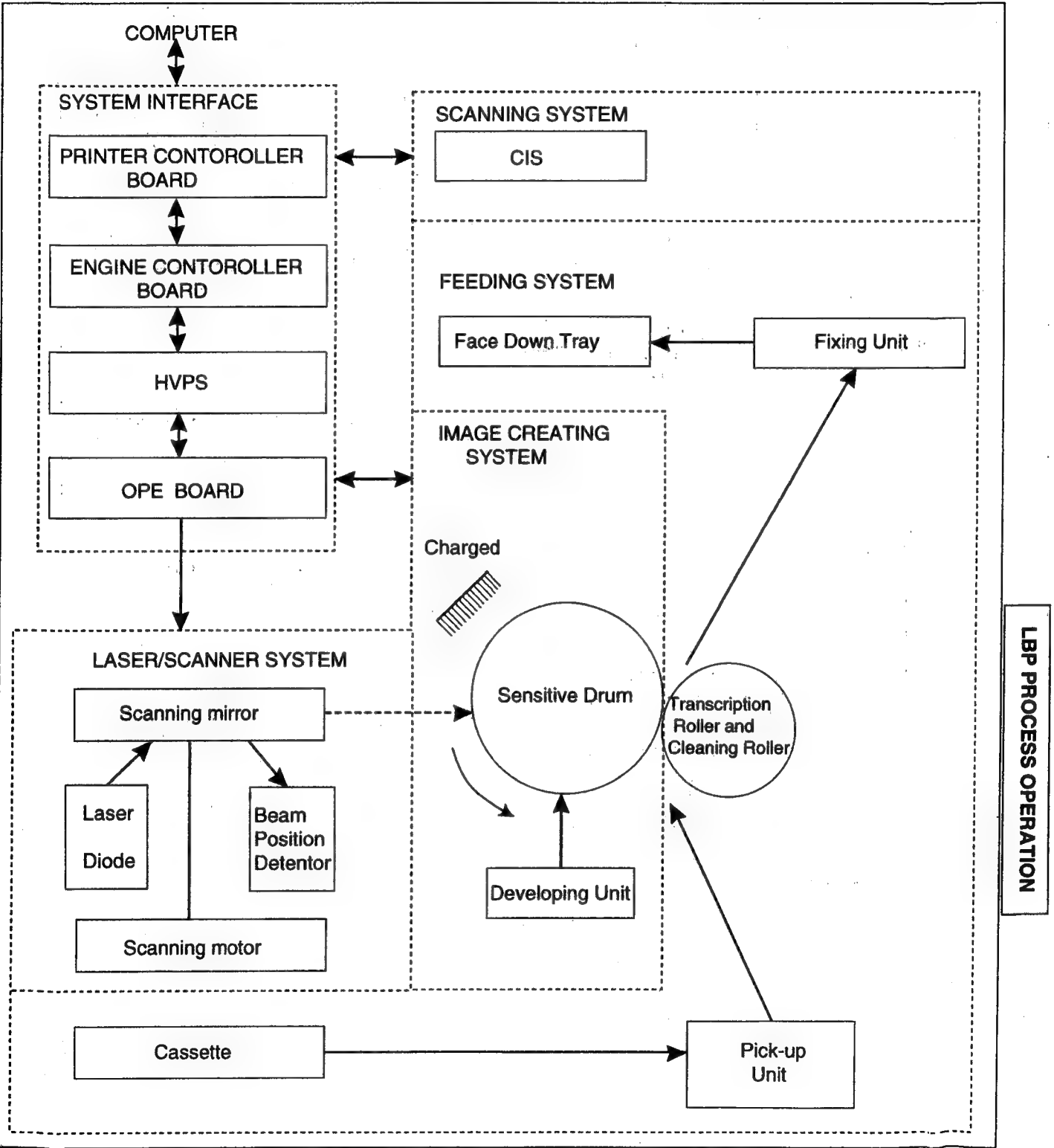
1. P.C.B LOCATION



- ① Operation Panel Board
- ② High Voltage Power Supply
- ③ Engine Controller Board
- ④ SMPS
- ⑤ Printer Controller Board
- ⑥ Analog Board
- ⑦ Digital Board

2. PRINTER OPERATION PRINCIPLE (Printer Block Diagram)

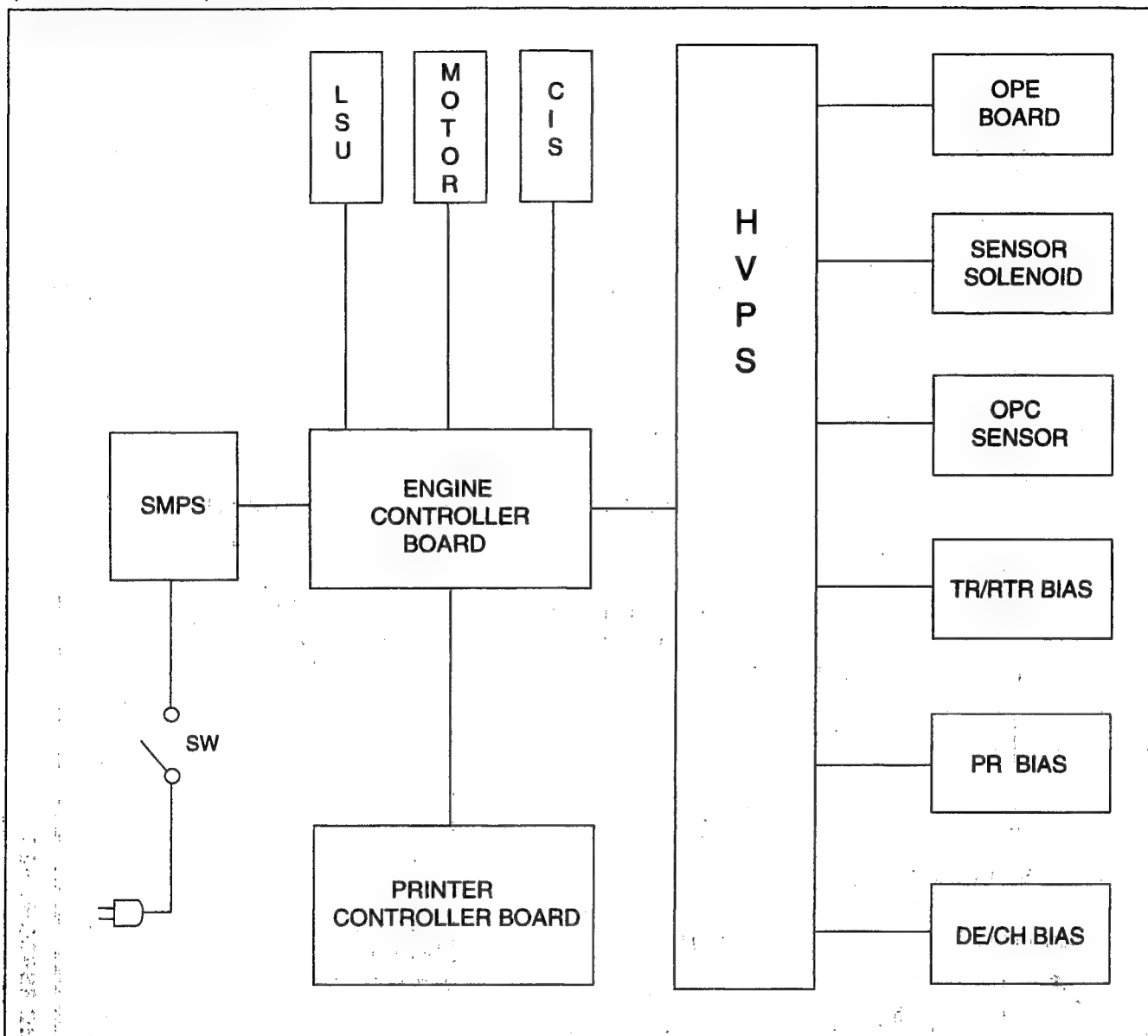
The function of the unit provided with the printer consists of the system interface, image creating system, laser/scanner system, feeding system and scanning system.Face Down Tray



LBP PROCESS OPERATION

3. ELECTRIC OPERATION PRINCIPLE (Electric Block Diagram)

The operation of the printer block is controlled by the microprocessor on the printer controller. The external image data is processed while the printer is on-line, and the scan and copy are available.



4. ROLLERS OPERATION

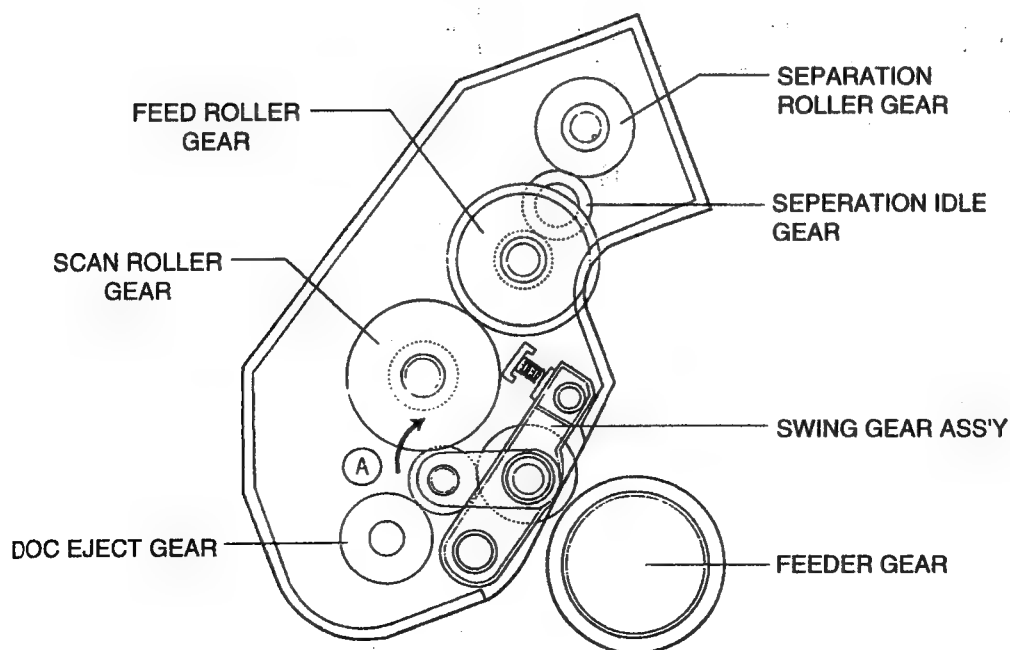
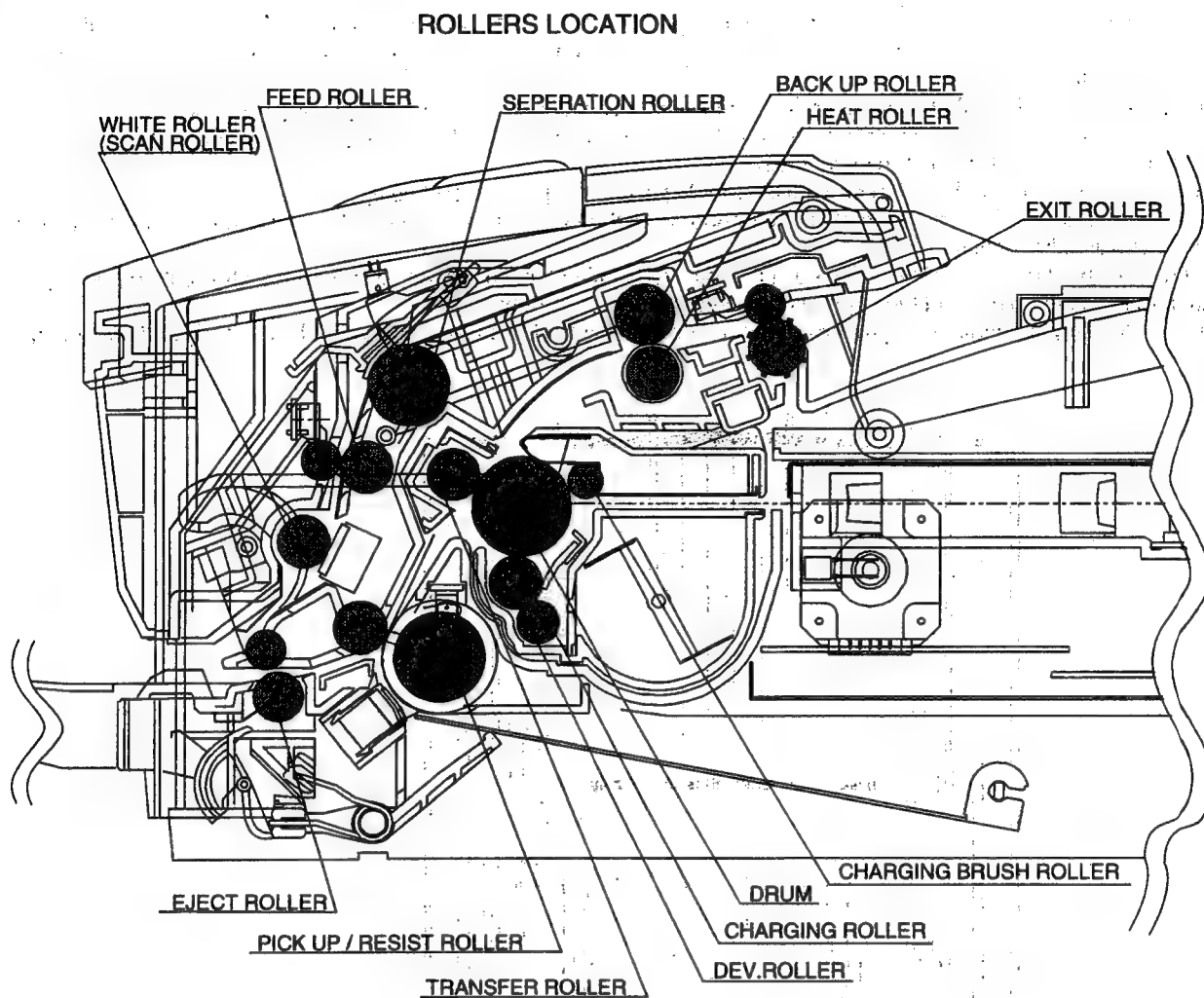


Fig (a)

LBP PROCESS OPERATION

This combination printer is operated by a single motor and is designed so that copying and printing can be performed at the same time. As shown in Fig.(a),the main motor is driven forward and backward,with printing possible when it is driven forward and scanning possible when it is driven backward.

When printing is performed,as Fig.(a) shows, the swing gear is connected to the eject roller, so printing is possible,but when the document is fed during copying, the main motor is driven in the reverse direction and the swing gear moves in direction (A) .At this time,the rollers linked to the ADF provide the drive force.

When copying starts,the main motor is driven forward in order to pick up the paper is picked up.

The Seperation roller is driven forward by the main motor and when the fax solenoid comes ON,the eject roller and scan roller on the left side are driven simultaneously.

Fig.(b) shows the movement direction of the drive power.in the case of direction(A),the fax solenoid turns OFF during printing, so the seperation roller is not driven and the seperation roller feeds the document.

For initial document feeding, the main motor rotates in the reverse direction while receiving drive in direction (B) and feeding the document.

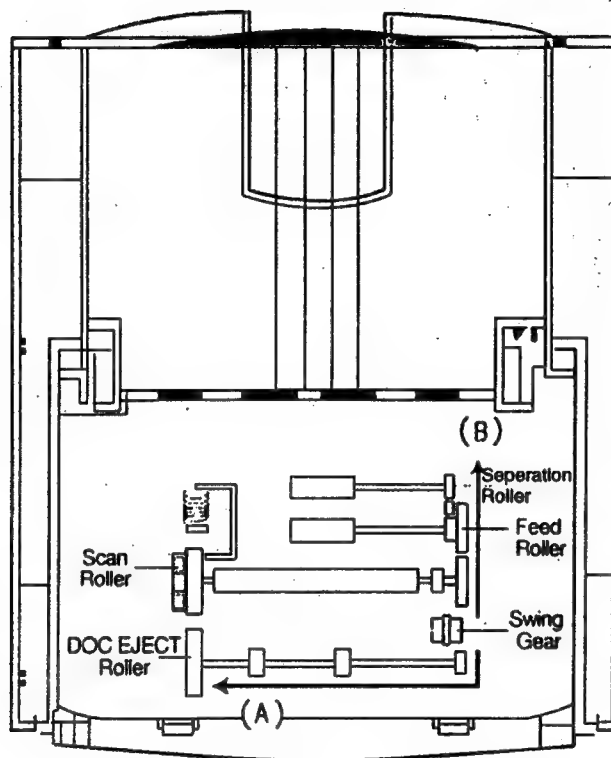


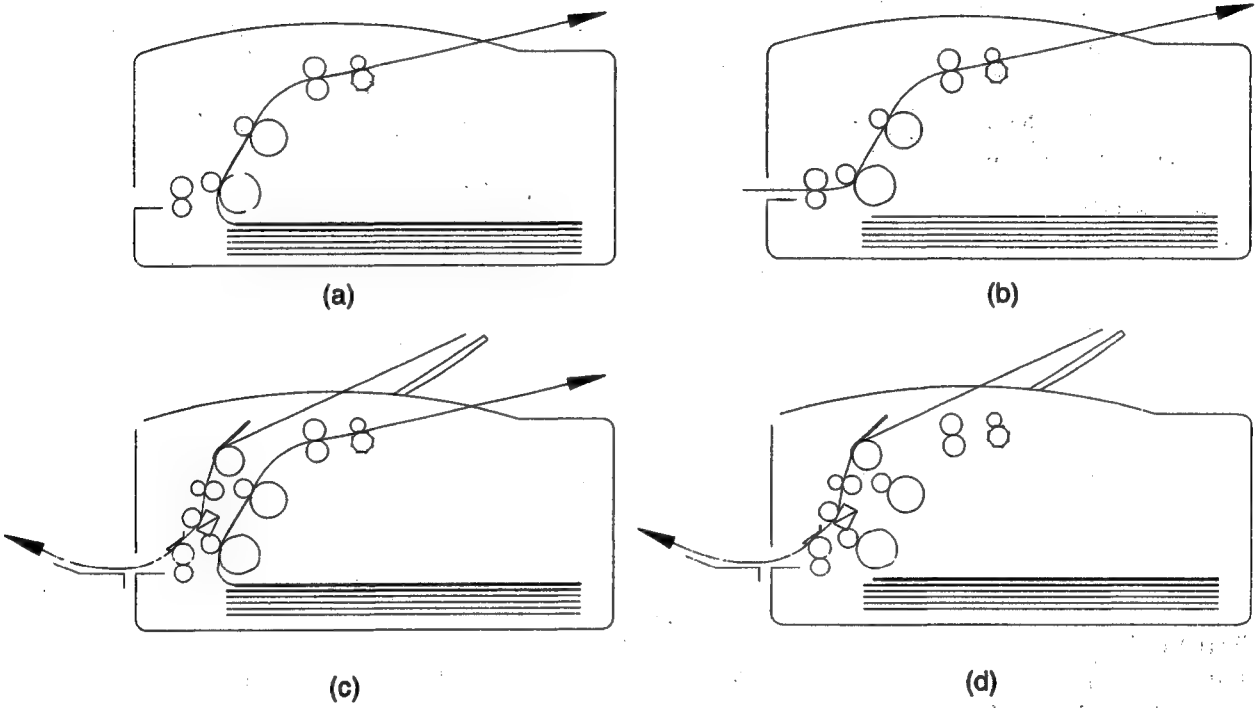
Fig (b)

5. PRINTING OPERATION PRINCIPLE

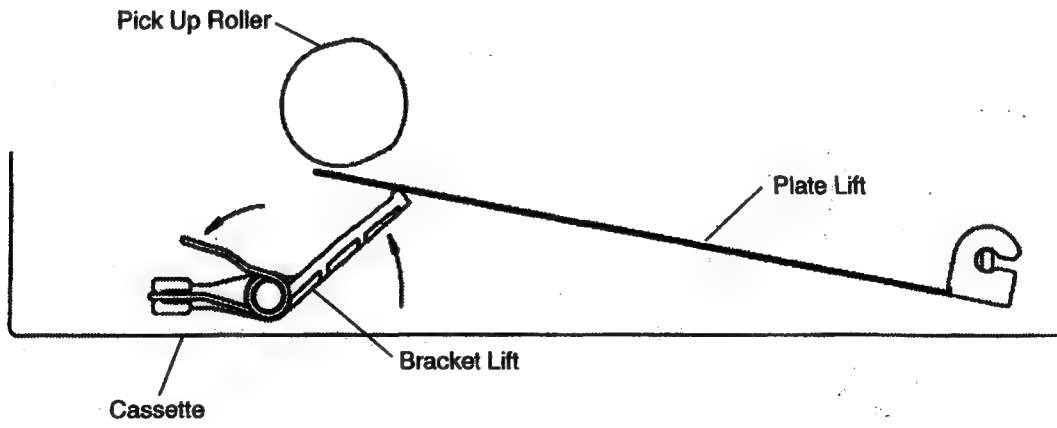
When the unit provided with the printer, the paper is carried passing the following route.

- (a) When feeding with the cassette.
- (b) When manual feeding.
- (c) When copying.
- (d) When scanning.

Paper Path



When the cassette is attached

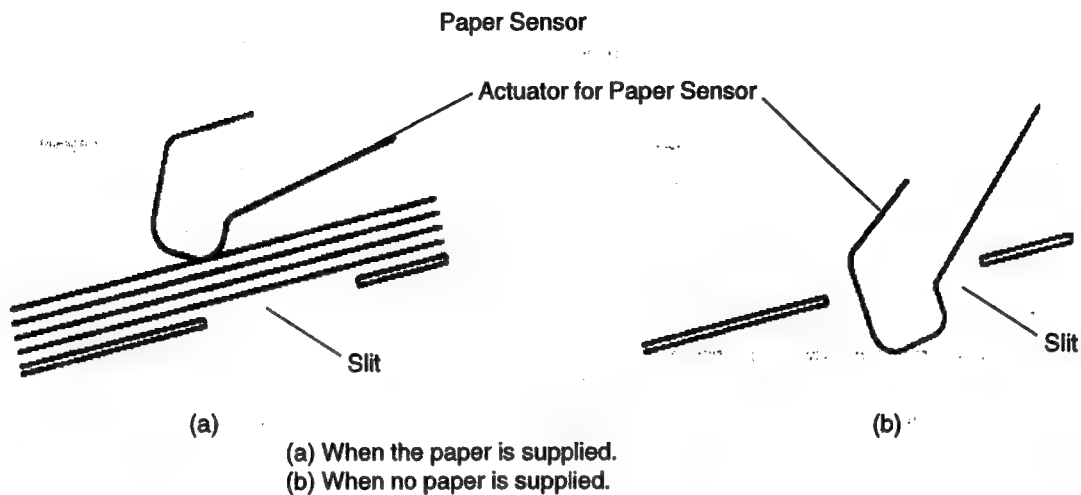


LBP PROCESS OPERATION

5.1 PAPER SENSOR

When the cassette is attached, the paper is detected by the paper sensor.

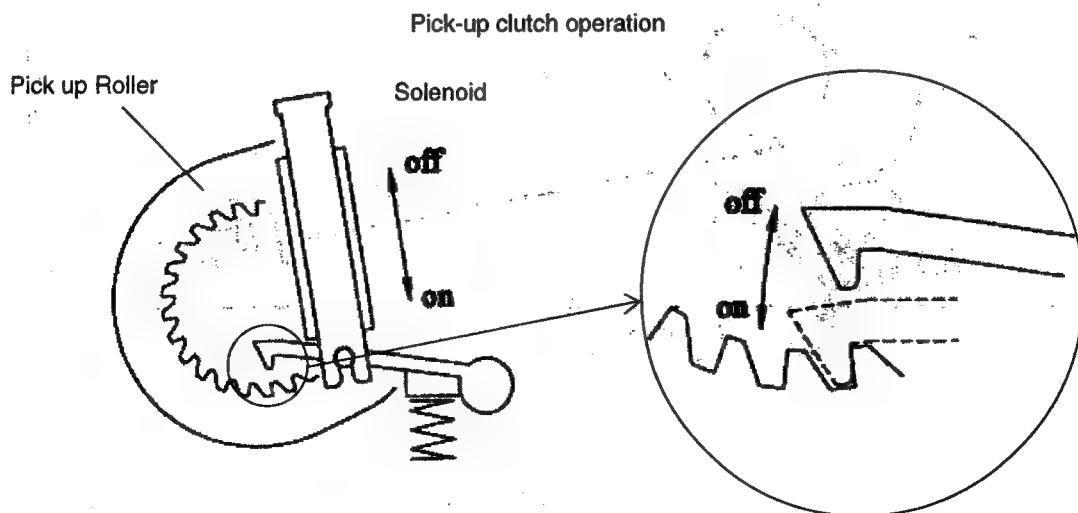
There is a slit on the cassette knock-up plate, so that the actuator enters the slit when no paper is supplied, then paper sensor is turned ON to detect that there is no paper.



5.2 PICK UP ROLLER

3) When feeding, the pick-up clutch is driven to skip the pick-up roller. The roller provided with CAM does not drive because of the clutch. When the voltage of 24V is added to the solenoid, the force is generated to pull up the actuator solenoid. Then the actuator clutch is moved from the pick-up roller.

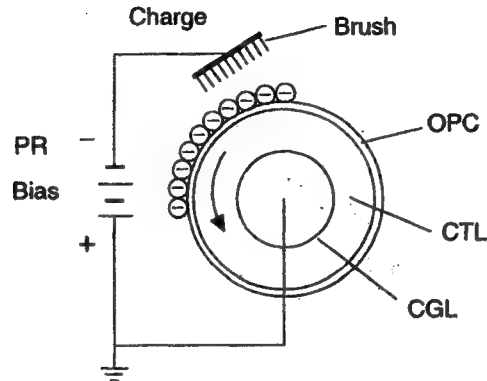
At that time the pick-up roller returns to the home position after picking up the paper. When manual feeding, the paper presses the manual feeding sensor and the register roller holds the paper. While printing the paper is carried by the register roller.



5.3 CHARGING

Charging is the stage that keeps the surface of the sensitive drum a fixed electric potential. The sensitive drum is the Organic Photo Cylinder (OPC), which is an aluminum cylinder whose surface is covered with the Charge Transfer Layer and (CTL) Charge Generation Layer(CGL).

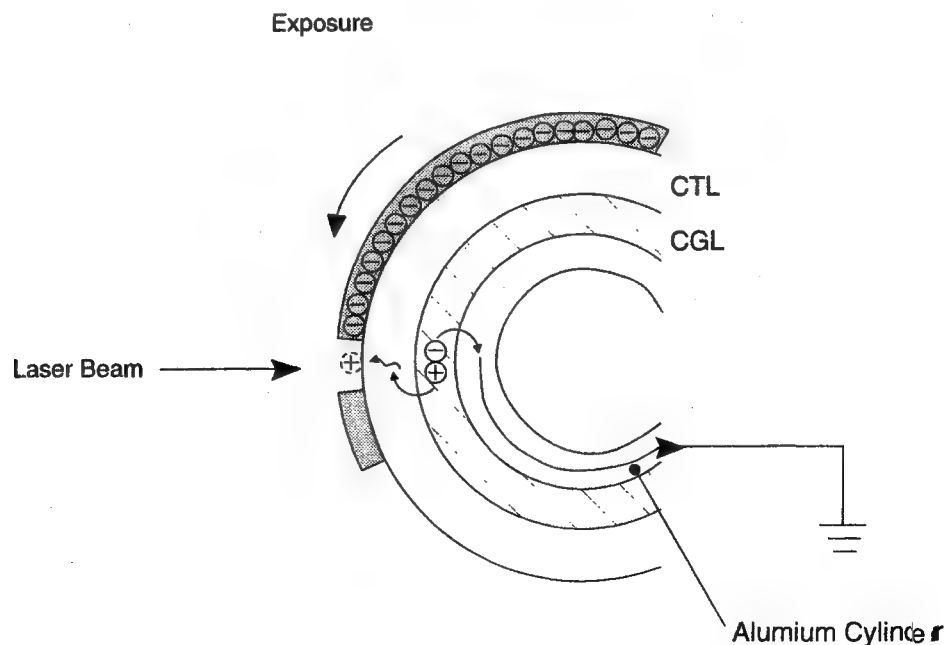
When the high voltage is added and the minus charge is supplied to the charge brush while charging, the whole surface of the drum is minus-charged.



5.4 EXPOSING

When the drum which is (CGL) charged with the fixed electric charge is irradiated by the laser beam, the plus charge is generated at the Charge Generation Layer. Passing through the Charge Transfer Layer (CTL) which conducts the plus charge, the minus charged drum surface is neutralized to be skipped. Consequently the charge of the part which is not exposed remains as it is, and the electric potential of the scanned part changes.

At that time an invisible image is created on the drum.



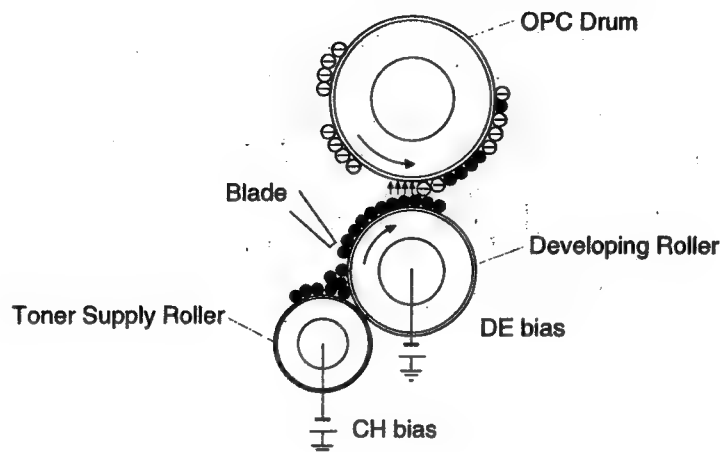
5.5 DEVELOPING

The developing is the stage that the sensitive drum with an invisible image is changed to visible by the toner.

The developer consists of developing roller, toner supply roller and the blade. The bias voltage is added to the developing roller and toner supply roller, then these 2 rollers are minus-charged by the friction.

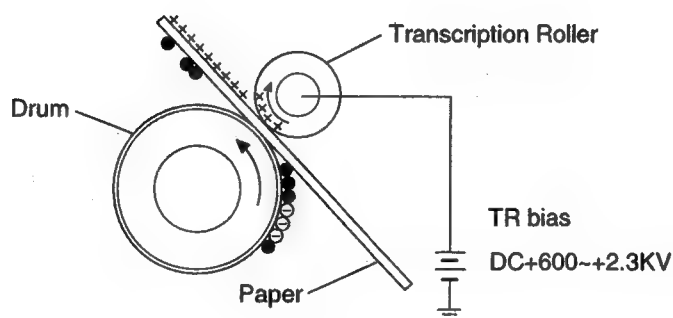
Consequently the toner is transferred to the surface of the exposed sensitive drum.

Developing roller



5.6 TRANSCRIPTION

The transcription is the stage that the created image on the sensitive drum is transferred to the paper. When the transcription roller is plus-charged with the image, the minus-charged toner particles are gathered on the surface of the drum and transferred to the paper.

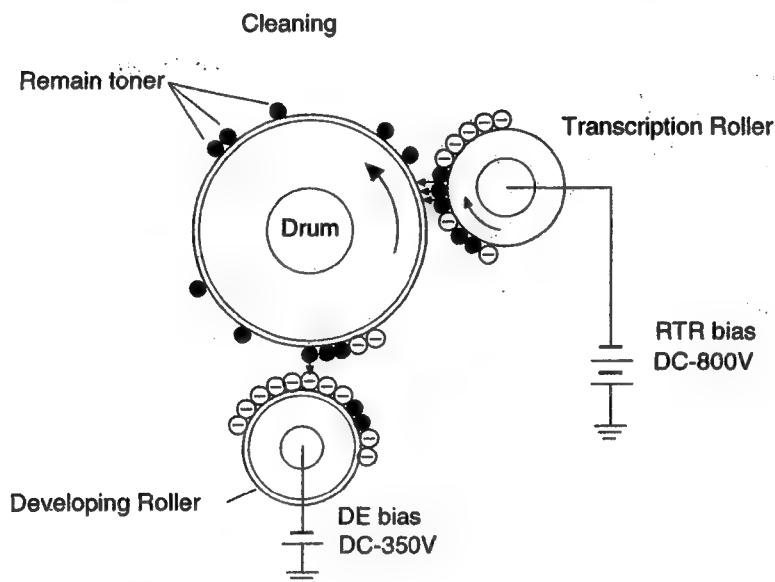


This printer employs the transcription roller method instead of the corona transfer method, and the followings are the merits.

1. The voltage is rather low comparing with the corona method.
2. Little ozone is generated.
3. The paper is supported by the sensitive drum and the transcription roller.

5.7 CLEANING

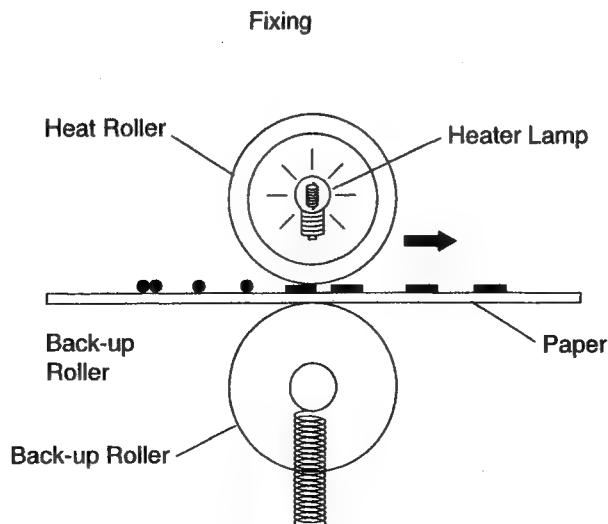
The toner attached to the surface of the sensitive drum is transferred to the paper at the transcription stage, but a part of the toner remains. The cleaning is the stage that cleans the remain toner after the transcription stage. The remain toner on the drum and the toner which was attached to the place where the laser beam didn't scan are gathered to the developing roller to be used again. When no paper is supplied, the transcription roller is minus charged to eliminate the minus-charged toner.



5.8 FIXING

On the process of the transcription, the transferred toner is weakly attached on the paper by the static electricity. Fixing means the process to fix the toner on the paper permanently. The fixing part melts the toner at the high temperature using the heater lamp.

The toner is fixed on the paper by the heat and pressure through the fixing part with the image. The surface of the heater roller is resined by Teflon and lubricated to prevent from attaching the toners. The back-up roller is made of silicon, and its spring compresses the melted toner.



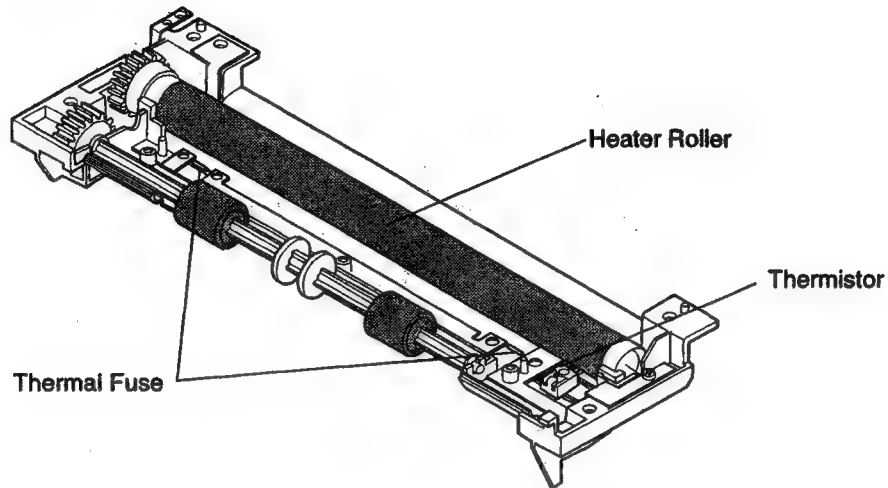
The fixing part becomes high temperature, so the thermistor and the thermal fuse are provided.

1) Thermistor

The thermistor touches the heater roller and check the temperature to feed back to the control circuit. The surface temperature should be kept 150 C° while printing.

2) Thermal Fuse

The thermal fuse takes the similar role with the thermistor. The thermal fuse is located 1.5 mm away from the heater roller and turns off the power when the temperature around the thermal fuse becomes over 150°C.



5.9 IMAGE READING

The Image Reading Part feeds and ejects the document when copying or scanning. The image reading part consists of the followings.

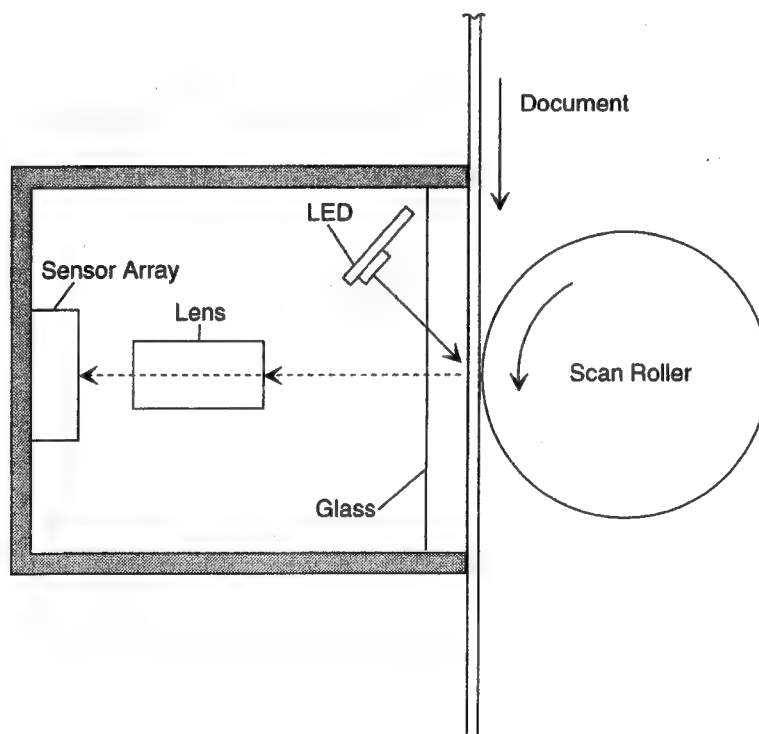
5.9.1 Automatic Document Feeder

The automatic document feeder consists of various kinds of rollers, ADF rubbers, springs, etc. It divides the documents and transfers to the reading part, then stacks the documents on the document ejector (manual feeder) when finished reading. This automatic document feeder is affordable until 15 documents at once. When the user put a document on the document feeder and the top of the document is touched, the document detect sensor is turned ON and the motor is driven.

The driven motor feeds the document and transfers it a little. When the printing part is ready for reading the document, the motor is driven again by the operation of the user to move the roller at a fixed speed. The documents are fed one by one separated by the ADF rubbers. The spring coil adds the pressure to the document so that the ADF rubber can separate the documents properly. ADF spring helps the document endure the pressure of ADF rubber to be fed smoothly. The document is ejected just like the manual feeding.

5.9.2 CIS (Contact Image Scanner)

CIS consists of LED, lens and sensor array. When the light emitted from LED is reflected on the document, the light reaches the sensor through the lens, then the sensor array detects the document.



LBP PROCESS OPERATION

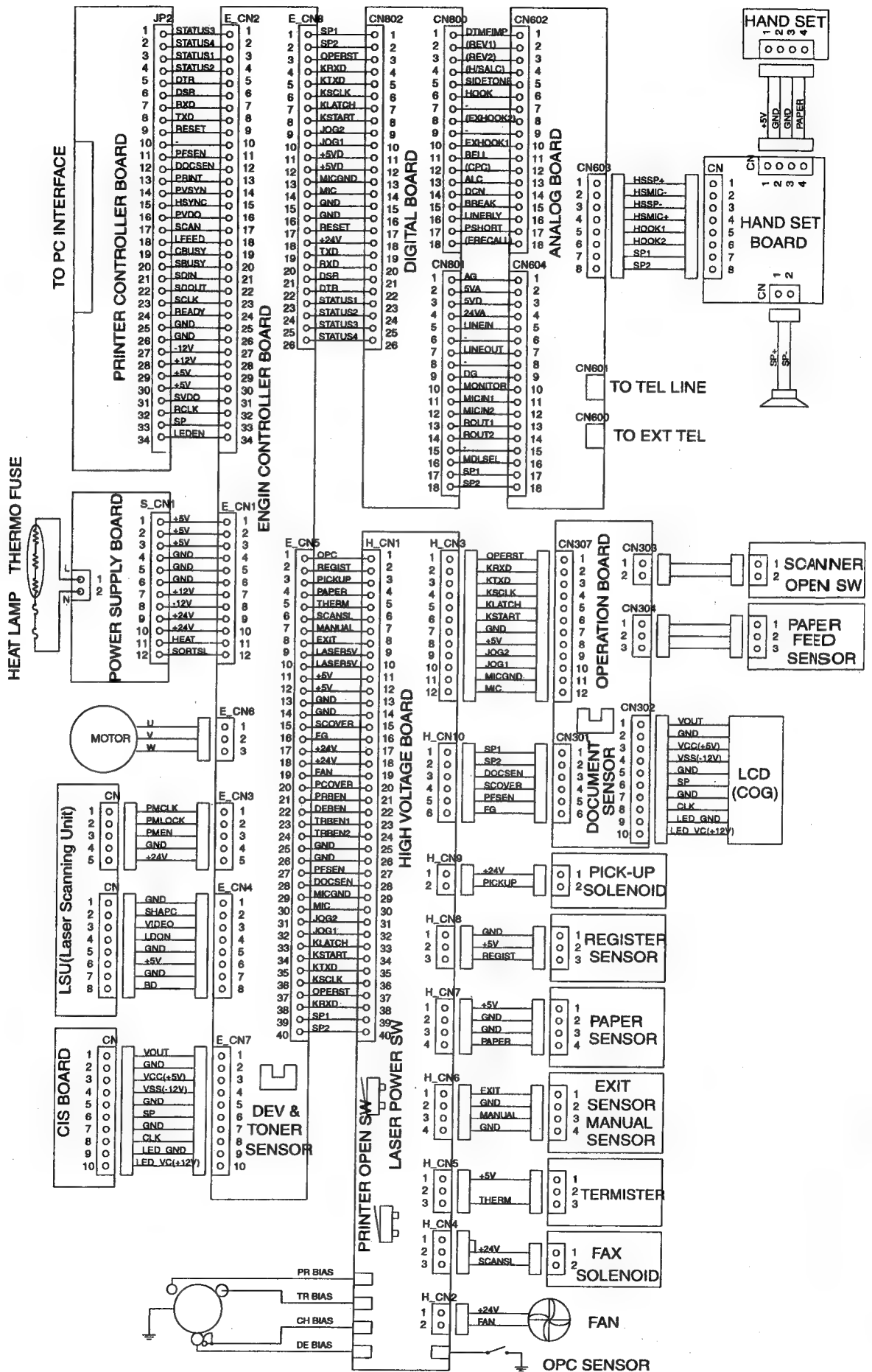
CIRCUIT OPERATIONS

1. Connection Diagram	117, 118
1.1 Connection Diagram (1)	117
1.2 Connection Diagram (2)	118
2. General Block Diagram	179~184
2.1 Relation of 3 CPUs & ROMs	182
2.2 Image Data Flow	183, 184
3. Fax Control Section	185~209
3.1 Explanation of Pin Distribution (IC807)	188~190
3.2 Reset Circuit (Watch Dog Timer)	191
3.3 SRAM and RTC Back up Circuit	192
3.4 Modern Section	193~199
3.5 Analog Section	200~203
3.6 NCU Section	204, 205
3.7 ITS and Monitor Section	206
3.8 Auto Disconnect Circuit	207
3.9 Tam Interface section	208, 209
4. Printer Controller Section	210~221
4.1 Fax Control Printer Controller Communication	211
4.2 Printer Controller Board	212~221
5. Engine Controller Section	222~228
5.1 Fixer Temperature Control Circuit	222
5.2 Solenoid Drive Circuit	222
5.3 Stepping Motor Drive Circuit	223, 224
5.4 Fan Motor Drive Circuit	225
5.5 LSU Control Circuit	226~228
6. Sensors and Switches Section	229~235
6.1 Document Sensor	230
6.2 Paper Feed Sensor	230
6.3 Scanner Cover Open Sensor	231
6.4 Hook Switch	231
6.5 Printer Cover Open Switch / Laser 5V Switch	232
6.6 Paper Sensor	232
6.7 Manual Switch/Exit Switch	233
6.8 Resist Sensor	233
6.9 OPC Sensor	234
6.10 Dev. & Toner Sensor	235
7. H.V.P.S. Section	236~240
7.1 HVPS Specifications	236
7.2 PR BIAS (PRINTER BIAS) UNIT	237
7.3 CH-BIAS/DE-BIAS	237
7.4 TR-BIAS/RTR-BIAS	238~240
8. Operation Board Section	241
9. LCD Section	242
10. Power Supply Board Section	243~246
10.1 Heat Lamp Control Circuit	244, 245
10.2 Power Supply Flow	246

1. CONNECTION DIAGRAM

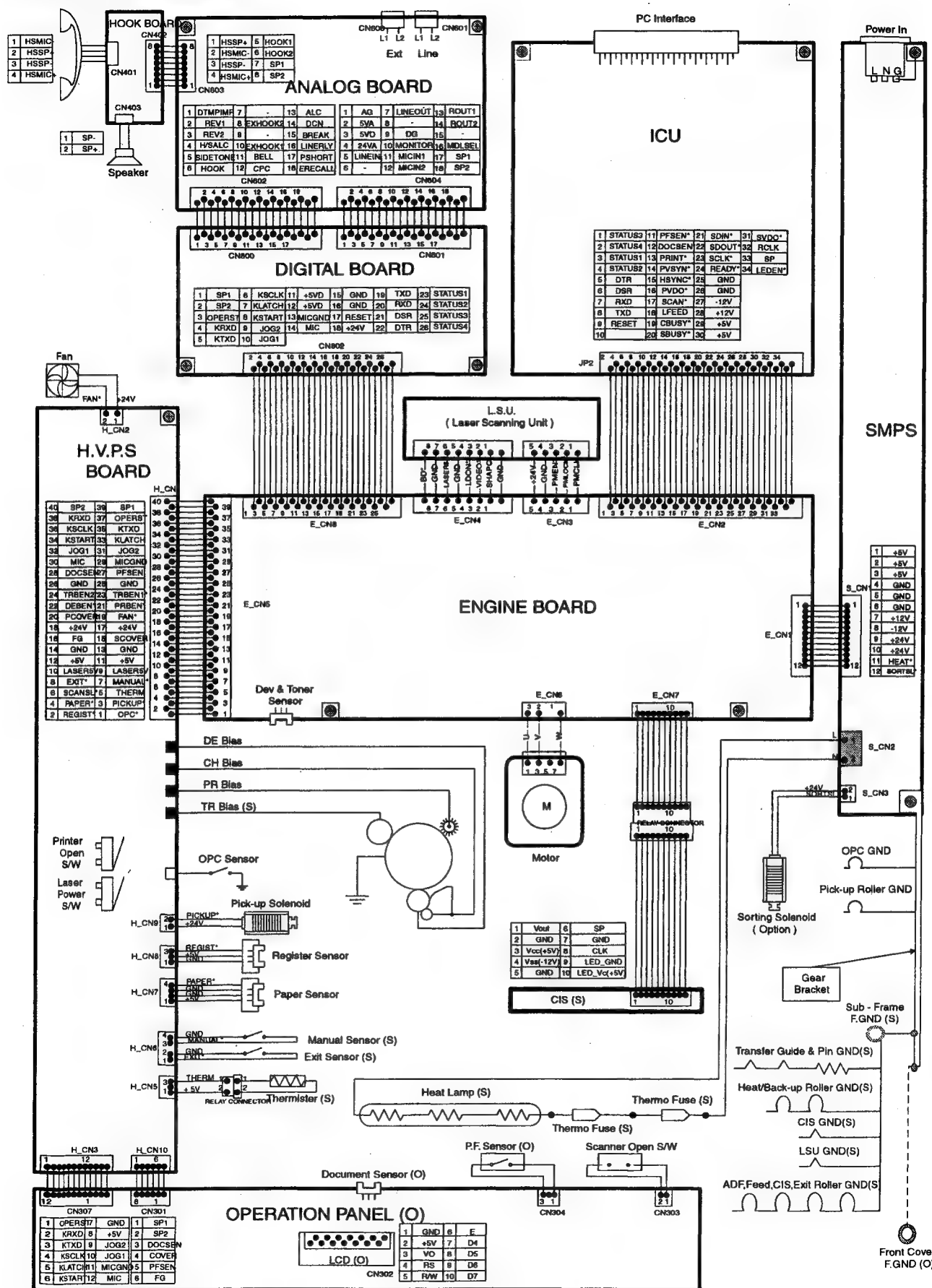
1.1 CONNECTION DIAGRAM (1)

KX-FLM600G



KX-FLM600G

1.2 CONNECTION DIAGRAM (2)



* :Frame Ground Point

2. GENERAL BLOCK DIAGRAM

The control section will be explained as shown in the block diagram.

1) Digital Board

Digital Board controls mainly TEL basic function, FAX communication function, Operation panel and LCD.

① ASIC(IC807)

Composed mainly of an address decoder and modem control section.

Controls the FAX operations.

Controls the operation panel I/F.

CPU and Real time clock

Provides the reset pulse to each of the major ICs.

② ROM(IC808)

Contains all of the program instructions for FAX unit operations.

③ Static RAM(IC805)

This Memory is used mainly for the parameter working storage area and the user setting parameters.

④ Dynamic RAM(IC804)

This Memory is used mainly for the CPU working and receiving memory.

⑤ MODEM(IC802)

Executes modulation and demodulation for FAX communication.

⑥ Analog ASIC(IC811)

Composed of crosspoint switch ,electric volume and VOX detect circuit.

2) Analog Board

The analog section works as an interface between the telephone line. Composed of an ITS circuit and NCU circuit.

3) Printer Controller Board

Printer Controller Board controls mainly printing function, scanning function and PC communication.

① RISC CPU(U1)

Composed mainly of an address decoder and printing control section.

Controls the image processing.

LSU I/F

Serial I/F for Digital board.

Serial I/F for Engine controller board.

Parallel I/F for the PC.

② G/A(U10)

Address decoding.

Reset control.

Generates scanner control signal.

Generates Engine Video Clock.

③ AK8414(U9)

Execute image processing.

④ Dynamic RAM(U2,U5,)

This Memory is used mainly for the CPU working area and imaging data buffer.

⑤ Flash ROM(U4,U7)

Contains all of the program instructions for PRINTER unit operations.

4) Engine Controller Board

Engine board controls the unit or parts related with printing :motor, sensors, heater, LSU and fan, etc.

① MPU(U5)

8bits one chip Microcomputer

Controls printing function.

Contains CPU, 60KB ONE TIME PROM, general I/O and A/D convertor.

② Motor Drive Controller(U4)

Controls the motor driving for the three-phase stepping motor

Drives the motor by fixed current of the PWM(Pulse Width Modulation) control.

③ Motor Driver(U8)

Drives the motor.

Composed four transistors.

5) Read Section

CIS image sensor to read transmitting documents.

6) LSU(Laser Scanning Unit)

Forms the images on the OPC drum by rotating polygon motor and reflecting the laser beam against polygon mirror.

7) Fixing Unit

Composed heat lamp, thermistor and two thermal fuses.

8) Sensor Section

Composed of a cover open sensor, document sensor, paper feed sensor, a scanner cover open switch, laser power switch, exit switch, manual switch, set paper sensor, paper regist sensor, OPC drum switch, Dev & toner sensor.

9) SMPS(Switching Mode Power Supply) Board

Supplies +5V, +24V and -12V to the unit and controls heater.

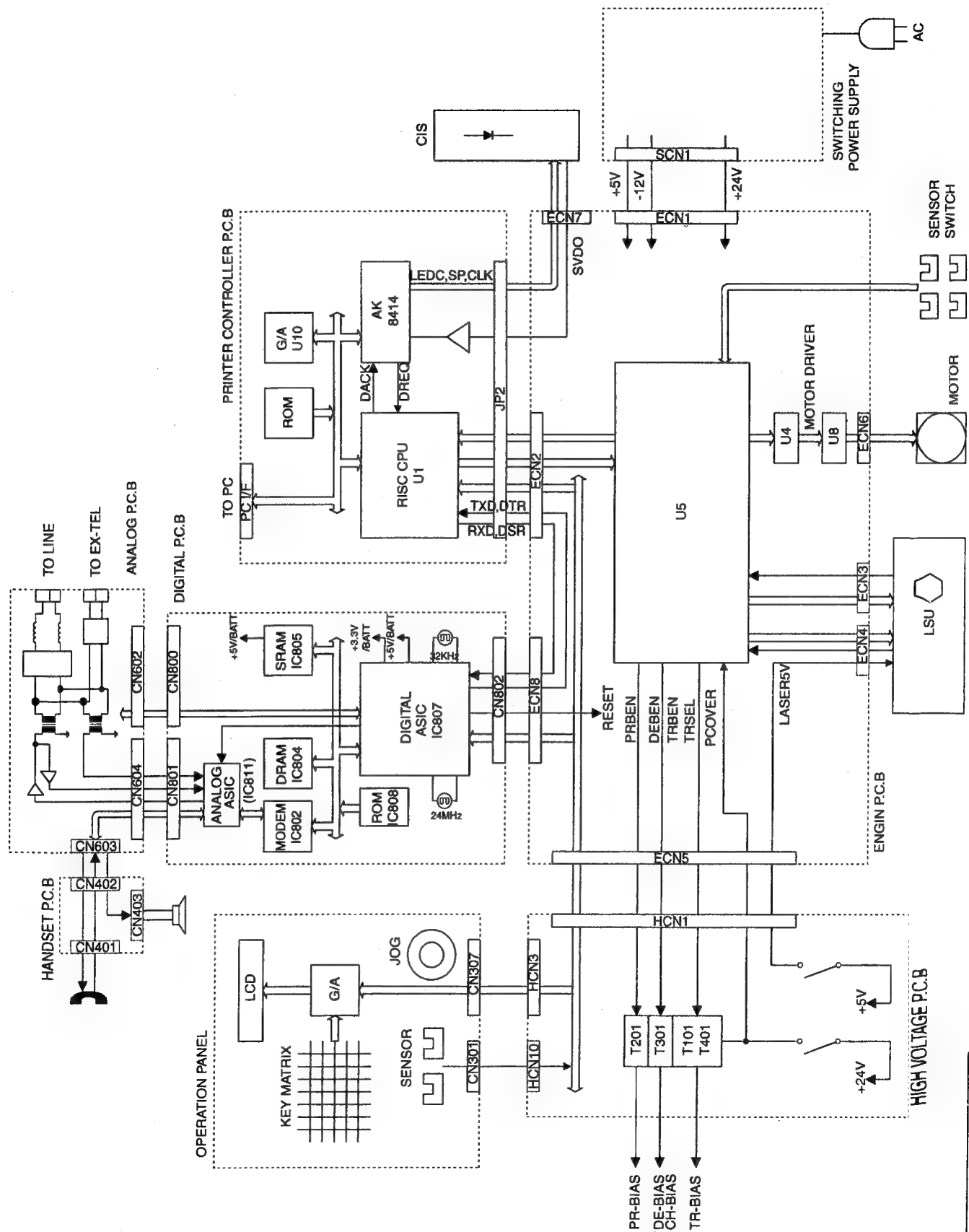
10) HVPS(High Voltage Power Supply) Board

Supplies bias need for the printing operation : bias of the OPC, developing and transcription.

11) Operation Panel Board

Consists of a LCD(Liquid Crystal Display), KEYS and LEDs. They are controlled by the Gate Array(IC301) and ASIC(IC807 :on the Digital Board).

General Block Diagram



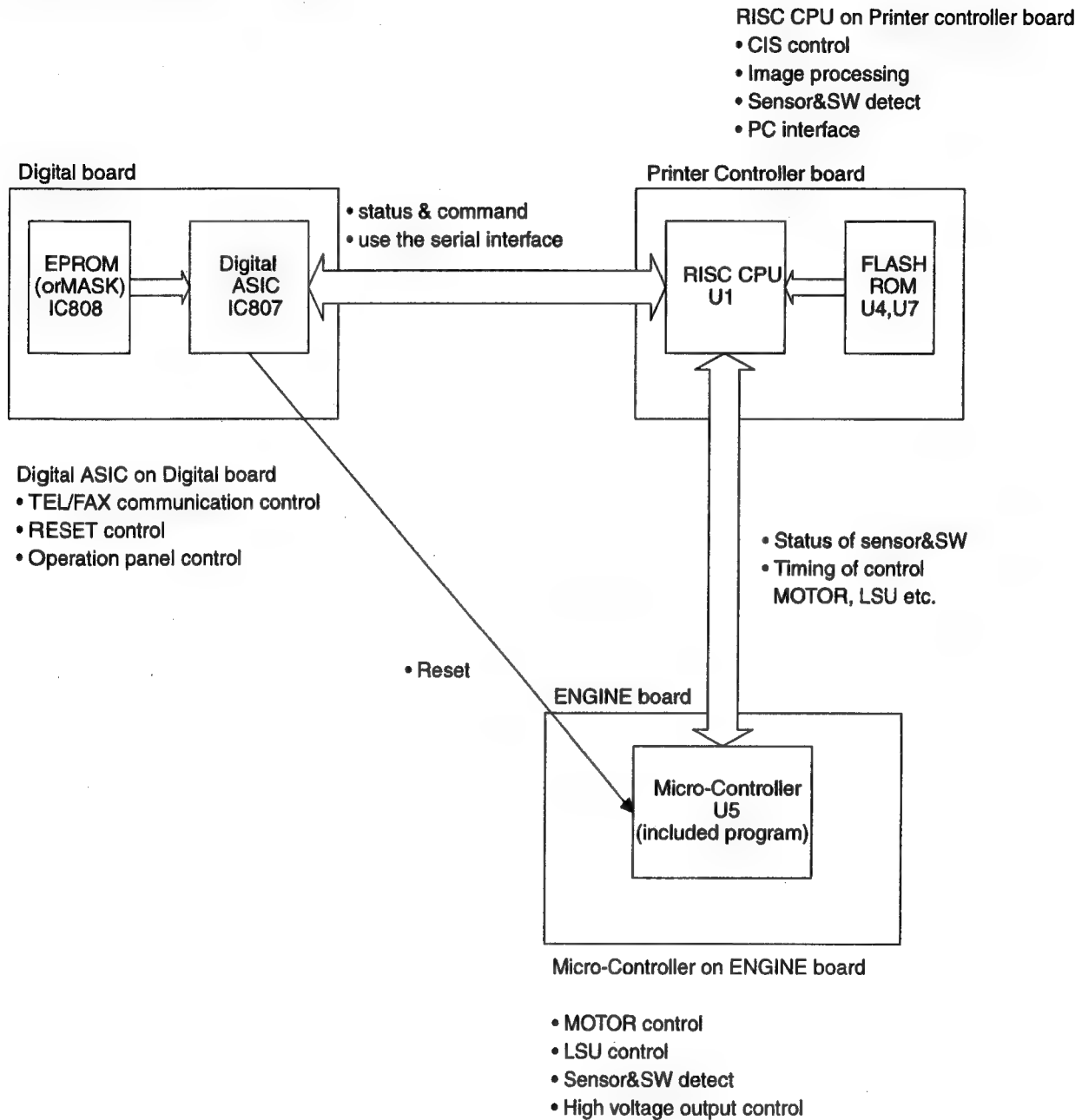
CIRCUIT OPERATIONS

2.1 RELATION OF 3 CPUS & ROMS

There are 3 CPUs and 3 ROMs in KX-FLM600.

If these 3 ROMs' version are unmatched, the unit does not work correctly.

The function of each CPU and relation of each other CPUs are shown below.

**How to check ROM version**

Enter service mode. Press MENU key, then input #9000 *551(ROM CHECK MODE).

As you press the START key, you can know each ROM version.

DIGITAL ROM version

ENGINE ROM version

PRINTER CONTROLLER ROM version

2.2 IMAGE DATA FLOW

Refer to the block diagram on the following page.

1. COPY

- 1) White plate information is read by CIS (to be used as the reference white level) via route 1, and the result is input to U9.
- 2) In U9, via route 2, it is stored in RAM as shading data.
- 3) The draft's information that is read by CIS is input to U9 via route 1. After adjusting it to a suitable level for A/D conversion via route 4, the draft's information is converted to A/D (6 bits), and it is input to the Image Processing Section via route 5. The other side, the shading data which flows from RAM via route 3, is input to the Image Processing Section. After finishing the draft's information image processing, white is regarded as "0" and black is regarded as "1".
- 4) The white/black data is input to the S/P converter via route 6. The white/black data converted to parallel data in the S/P converter is input to DRAMs(U2,U5) via routes 7 and 8 by DMA.
- 5) The stored data in DRAMs(U2,U5) is input to LSU via routes 9,10,11 and 12 by DMA.

2. TRANSMISSION

- 1) Same processing as COPY items 1)-4).
- 2) The data stored in DRAMs(U2,U5) is output from them via routes 9,10 and 13, and is compressed in MMR and then restored to DRAMs(U2,U5) via routes 14,19 and 8.
- 3) U1(CPU) retrieves the data stored in MMR buffer and forwards to DIGITAL BOARD via routes 9,10,21 and 22.
- 4) The CPU(IC807) inputs the data to the modem along routes 23 and 24, where it is converted to serial Analog data and forwarded over the telephone lines via the NCU section.

3. RECEPTION

- 1) The serial analog image data is retrieved over the telephone lines and input to the modem via the NCU section, where it is demodulated to parallel digital data. Then the CPU (IC807) stores the data in the communication buffer DRAM(IC804) along routes 28 and 29.
- 2) The CPU(IC807) forwards the data in DRAM(IC804) to PRINTER CONTROLLER BOARD via routes 30,31 and 32.
- 3) The CPU(U1) saved data to DRAMs(U2,U5) via routes 20,19 and 8.
- 4) The data stored in DRAMs(U2,U5) is output from them via routes 9,10 and 13. It is decompressed in U1 and restored to DRAMs(U2,U5) via routes 14,19 and 8.
- 5) U1 retrieved the data stored in BMP buffer and forwards to LSU to make a hardcopy via routes 9,10,11 and 12.

4. PC PRINT

- 1) U1(CPU) gets the data compressed in LZW format from PC via route 15 and stores it to DRAMs(U2,U5) via routes 17,19 and 8.
- 2) U1 retrieves the data stored in LZW buffer and decompresses it via routes 9,10,13,14 and 11. Finally, it is forwarded to LSU via route 12.

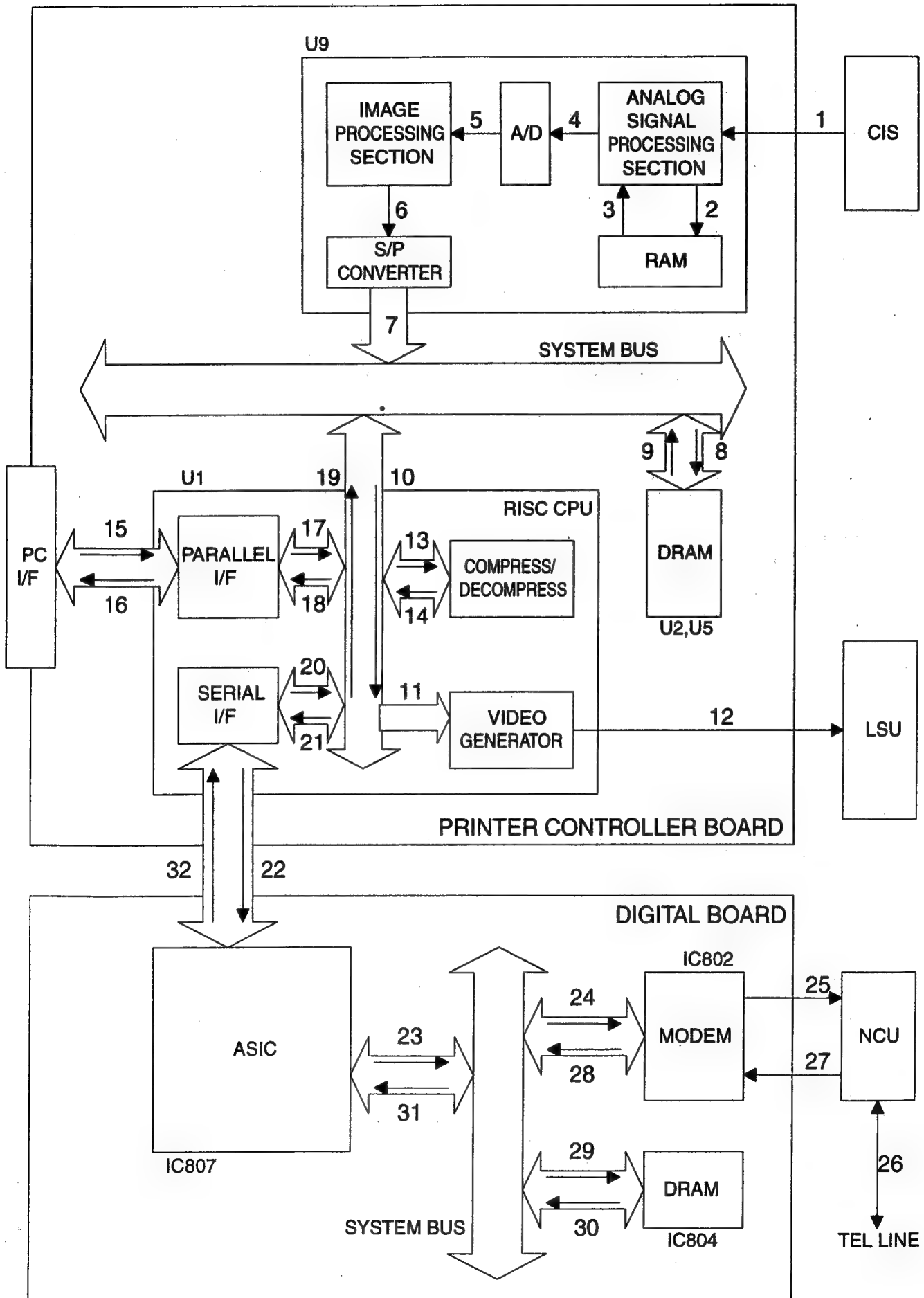
5. PC TRANSMISSION

- 1) U1(CPU) gets the data compressed in MH format from PC via route 15 and stores it to DRAMs(U2,U5) via routes 17,19 and 8.
- 2) U1 retrieves the data stored in PC-FAX buffer and forwards it to DIGITAL BOARD via routes 9,10,21 and 22.
- 3) The CPU(IC807) inputs the data to the modem along routes 23 and 24, where it is converted to serial Analog data and forwarded over the telephone lines via the NCU section.

6. PC RECEPTION

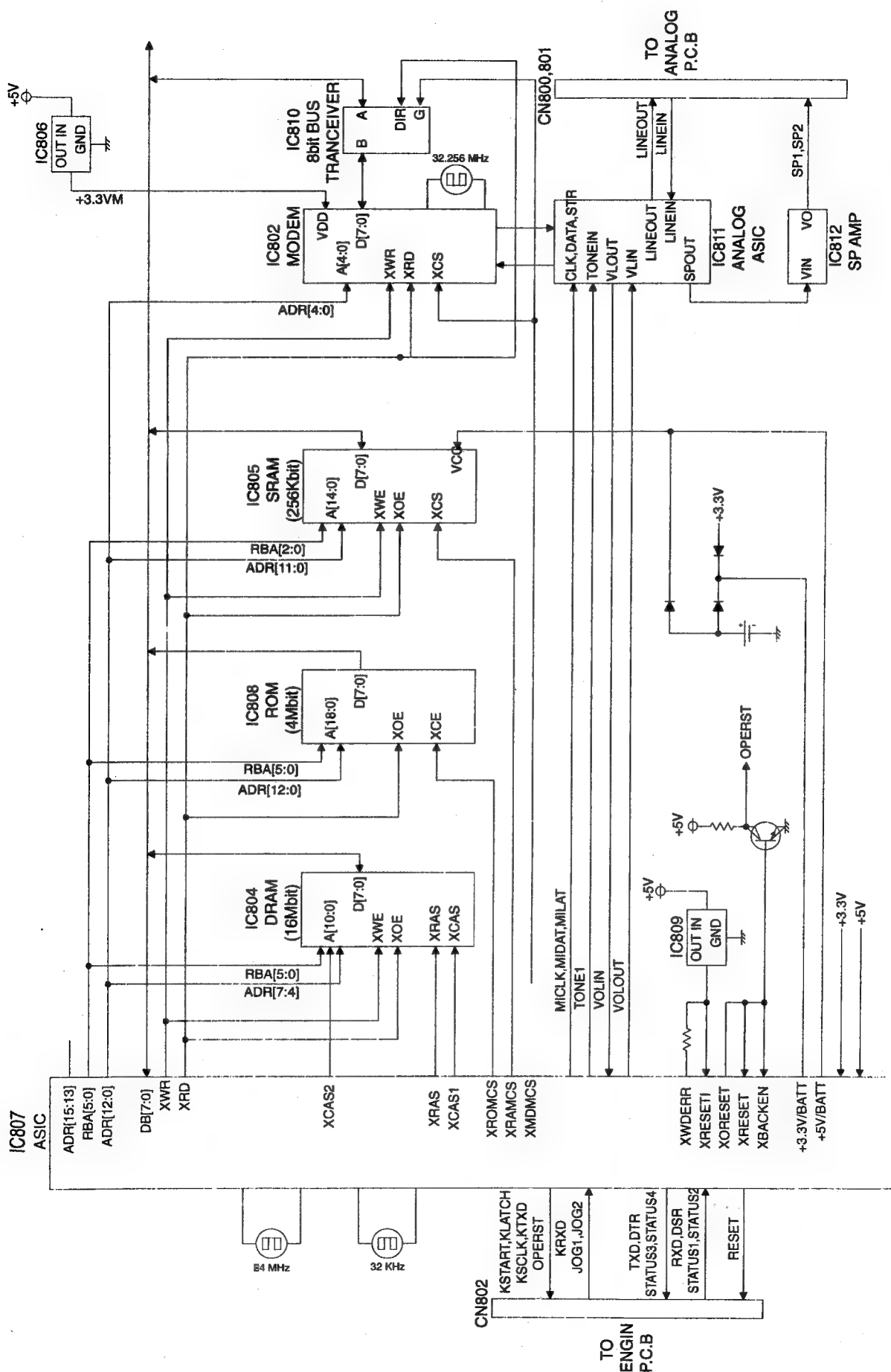
- 1) The serial analog image data is retrieved over the telephone lines and input to the modem via the NCU section, where it is demodulated to parallel digital data. Then the CPU (IC807) stores the data in the communication buffer DRAM(IC804) along routes 28 and 29.
- 2) The CPU(IC807) compresses the data in DRAM(IC804) in MH format and forwards the data to PRINTER CONTROLLER BOARD via routes 30,31 and 32.
- 3) The CPU(U1) saved data to DRAMs(U2,U5) via routes 20,19 and 8.
- 4) U1 retrieves the data stored in PC-FAX buffer and forwards it to PC via routes 9,10,18 and 16.

Data Flow Block Diagram

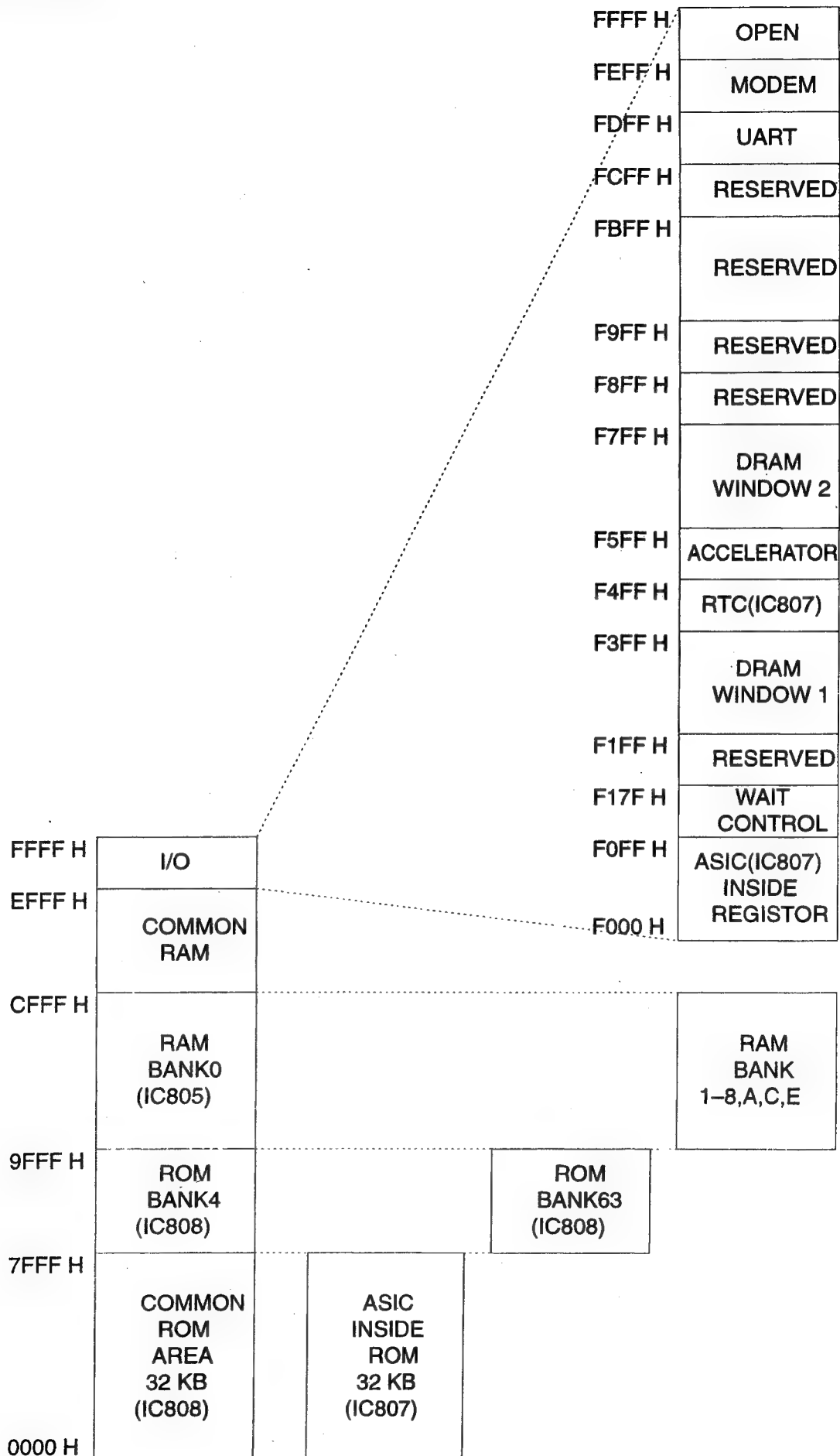


3. FAX CONTROL SECTION

Block Diagram



CIRCUIT OPERATIONS

MEMORY MAP


• ASIC (IC807)

This custom IC is used for general FAX operations.

- | | |
|--------------------------|--|
| (1) CPU: | This model uses a Z80 equivalent CPU operating at 12MHz.
Many of the peripheral functions are handled by custom designed LSIs.
As a result, the CPU only needs to process the results. |
| (2) RTC: | Real time clock. |
| (3) DECODER: | Decodes the address. |
| (4) ROM/RAM I/F: | Controls the SELECT signal of ROM or RAM and bank switching. |
| (5) OPERATION PANEL I/F: | Serial interface with Operation Panel. |
| (6) I/O PORT: | I/O Port Interface. |
| (7) ANALOG UNIT: | Electronic volume for the handset and monitor.
Sends beep tones, etc. |
| (8) ANALOG ASIC I/F: | |

• ROM (IC808)

This 512KB ROM (EPROM or MASKROM) has 32KB of common area and bank area (BK4~BK63).

The capacity of each bank is 8KB.

The addresses of the common area are from 0000H to 7FFFH, and addresses 8000H to 9FFFH are for the bank area.

• STATIC RAM (IC805)

This 32KB RAM has 8KB of common area and bank area (BK0~BK8,A,C,E).

The capacity of each bank is 12KB.

The addresses of the common area are from D000H to EFFFH, and addresses A000H to CFFFH are for the bank area.

• DYNAMIC RAM (IC804)

This DRAM is used for CPU work and receiving memory.

The address is from F200H~F3FFH (DRAM access window 1) and F600H~F7FFH (DRAM access window 2).

3.1 EXPLANATION OF PIN DISTRIBUTION (IC807)

3.7 Explanation of Pin Distribution (IC807)				
NO.	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	EXPLANATION
1	AIN1	A	3.3V	NOT USED
2	AIN2	A	3.3V	NOT USED
3	AIN3	A	3.3V	NOT USED
4	AMON	A	3.3V	NOT USED
5	VSSB		GND	POWER SOURCE(ANALOG GND)
6	VDDB		3.3V	POWER SOURCE(ANALOG +3.3V)
7	VDDB(3.3V/BATT)		3.3V/BATT	POWER SOURCE(+3.3V/LITHIUM BATTERY)
8	X32OUT	O	3.3V/BATT	RTC(32.768KHz) CONNECTION
9	X32IN	I	3.3V/BATT	RTC(32.768KHz) CONNECTION
10	VSS		GND	POWER SOURCE(GND)
11	XBACKEN	I	5V/BATT	BACKUP ENABLE
12	VDD(5V/BATT)		5V/BATT	POWER SOURCE(+5V/LITHIUM BATTERY)
13	XRAMCS	O	5V/BATT	RAM(IC805) CHIP SELECT
14	XRAMCS2	O	5V/BATT	NOT USED
15	FTG	O	5V	NOT USED
16	F1	O	5V	NOT USED
17	F2/OP50	O	5V	OUTPUT PORT(LINERLY)
18	FR/OP51	O	5V	OUTPUT PORT(BREAK)
19	VIDRST/IOP20	I	5V	INPUT PORT(BELL)
20	SPHCLK/IOP21	I	5V	INPUT PORT(EX-HOOK1)
21	DARKON/IOP22	I	5V	INPUT PORT(ALC)
22	ADSEL2/IOP23	I	5V	INPUT PORT(T/P)
23	CPC	I	5V	NOT USED(HIGH FIXED)
24	BELL	O	5V	NOT USED
25	VDD(5V)		5V	POWER SOURCE(+5V)
26	VSS		GND	POWER SOURCE(GND)
27	RVN	I	5V	NOT USED(LOW FIXED)
28	IRDATXD/IOP81	O	5V	OUTPUT PORT(MODEM RESET)
29	IRDARXD/IOP80	I	5V	INPUT PORT(DCN)
30	TXD/IOP30	O	5V	PRINTER & SCANNER DRIVER P.C.B INTERFACE
31	RXD/IOP31	I	5V	PRINTER & SCANNER DRIVER P.C.B INTERFACE
32	XRTS/IOP32	O	5V	NOT USED
33	XCTS/IOP33	I	5V	NOT USED(LOW FIXED)
34	XDSR/IOP34	I	5V	PRINTER & SCANNER DRIVER P.C.B INTERFACE
35	DCD/IOP35	O	5V	NOT USED
36	XDTR/IOP36	O	5V	PRINTER & SCANNER DRIVER P.C.B INTERFACE
37	RI/CLK/IOP37	I	5V	INPUT PORT(HOOK)
38	TONE1		5V	TONE OUTPUT
39	TONE2		5V	NOT USED
40	VOL1		5V	E-VOL REF VOLTAGE INPUT
41	VOL2		5V	E-VOL OUTPUT
42	VOL3		5V	E-VOL INPUT
43	MIDAT/IOP45	O	5V	ANALOG ASIC(IC811) CONTROL
44	MICLK/IOP46	O	5V	ANALOG ASIC(IC811) CONTROL
45	MILAT/IOP47	O	5V	ANALOG ASIC(IC811) CONTROL
46	XRESCS1/OP72	O	5V	OUTPUT PORT(DTMFIMP)
47	IOP90	O	5V	NOT USED
48	VSS		GND	POWER SOURCE(GND)
49	VDD(5V)		5V	POWER SOURCE(+5V)
50	XNMI	I	5V	HIGH FIXED
51	CBUSY2	O	5V	NOT USED
52	CSO/OP70	O	5V	NOT USED
53	CBUSY1	I	5V	INPUT PORT(VOX)
54	CCLK	I	5V	NOT USED(LOW FIXED)
55	CSI	I	5V	NOT USED(HIGH FIXED)
56	IOP91	O	5V	OUTPUT PORT(SIDETONE)
57	IOP92	O	5V	NOT USED
58	FMEMCS/IOP27	O	5V	NOT USED
59	FMEMDO/IOP26	O	5V	NOT USED
60	FMEMDI/IOP25	O	5V	NOT USED

NO.	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	EXPLANATION
61	FMEMCLK/IOP	I	5V	INPUT PORT (R/B)
62	XRESCS3/OP52	O	5V	OUTPUT PORT(P-SHORT)
63	20KOSC/IOP56	O	5V	NOT USED
64	XHOLDAK	O	5V	NOT USED
65	VDD(3.3V)		3.3V	POWER SOURCE(+3.3V)
66	XOUT	O	3.3V	SYSTEM CLOCK(24MHz)
67	XIN	I	3.3V	SYSTEM CLOCK(24MHz)
68	VSS		GND	POWER SOURCE(GND)
69	VDD(5V)		5V	POWER SOURCE(+5V)
70	XTEST	O	5V	24MHz CLOCK
71	CPUCLK	O	5V	NOT USED
72	TEST1	I	5V	HIGH FIXED
73	TEST2	I	5V	HIGH FIXED
74	TEST3	I	5V	HIGH FIXED
75	TEST4	I	5V	HIGH FIXED
76	XMDMINT	I	5V	MODEM(IC802) INTERRUPT
77	XMDMCS	O	5V	MODEM(IC802) CHIP SELECT
78	VSS		GND	POWER SOURCE(GND)
79	VDD(3.3V)		3.3V	POWER SOURCE(+3.3V)
80	XWAIT/IP60	I	5V	INPUT PORT(MDLSEL)
81	XHOLD/IP61	I	5V	NOT USED(HIGH FIXED)
82	XHSTRD/IOP40	O	5V	NOT USED
83	XHSTWR/IOP41	O	5V	NOT USED
84	XOPRBE/MUT/OP53	O	5V	NOT USED
85	ADR15	O	5V	CPU ADDRESS BUS 15 (NOT USED)
86	ADR14	O	5V	CPU ADDRESS BUS 14 (NOT USED)
87	ADR13	O	5V	CPU ADDRESS BUS 13 (NOT USED)
88	XRAS/IOP42	O	5V	DRAM(IC804) ROW ADDRESS STROBE
89	XCAS1/IOP43	O	5V	DRAM(IC804) CULUM ADDRESS STROBE
90	XCAS2/IOP44	O	5V	DRAM(IC804) ADDRESS9
91	VSS		GND	POWER SOURCE(GND)
92	VDD(3.3V)		3.3V	POWER SOURCE(+3.3V)
93	XRESCS2/OP71	O	5V	OUTPUT PORT(MODEM CSBR)
94	DB3	I/O	5V	CPU DATA BUS 3
95	DB2	I/O	5V	CPU DATA BUS 2
96	DB4	I/O	5V	CPU DATA BUS 4
97	DB1	I/O	5V	CPU DATA BUS 1
98	DB5	I/O	5V	CPU DATA BUS 5
99	DB0	I/O	5V	CPU DATA BUS 0
100	DB6	I/O	5V	CPU DATA BUS 6
101	DB7	I/O	5V	CPU DATA BUS 7
102	VSS		GND	POWER SOURCE(GND)
103	VDD(5V)		5V	POWER SOURCE(+5V)
104	XROMCS	O	5V	ROM(IC808) CHIP SELECT
105	XRD	O	5V	CPU RD
106	XWR	O	5V	CPU WR
107	ADR0	O	5V	CPU ADDRESS BUS 0
108	ADR1	O	5V	CPU ADDRESS BUS 1
109	ADR2	O	5V	CPU ADDRESS BUS 2
110	ADR3	O	5V	CPU ADDRESS BUS 3
111	ADR4	O	5V	CPU ADDRESS BUS 4
112	ADR5	O	5V	CPU ADDRESS BUS 5
113	ADR6	O	5V	CPU ADDRESS BUS 6
114	ADR7	O	5V	CPU ADDRESS BUS 7
115	ADR8	O	5V	CPU ADDRESS BUS 8
116	ADR9	O	5V	CPU ADDRESS BUS 9
117	ADR10	O	5V	CPU ADDRESS BUS 10
118	ADR11	O	5V	CPU ADDRESS BUS 11
119	ADR12	O	5V	CPU ADDRESS BUS 12
120	VSS		GND	POWER SOURCE(GND)
121	VDD(5V)		5V	POWER SOURCE(+5V)
122	RBA0	O	5V	ROM/RAM BANK ADDRESS BUS 0
123	RBA1	O	5V	ROM/RAM BANK ADDRESS BUS 1

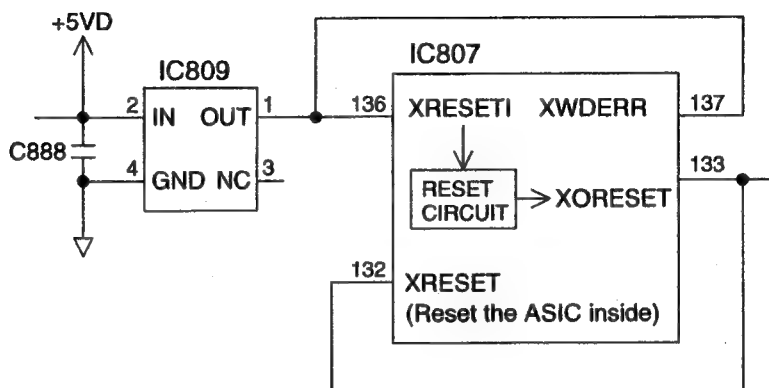
KX-FLM600G

NO.	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	EXPLANATION
124	RBA2	O	5V	ROM/RAM BANK ADDRESS BUS 2
125	RBA3	O	5V	ROM/RAM BANK ADDRESS BUS 3
126	RBA4	O	5V	ROM/RAM BANK ADDRESS BUS 4
127	RBA5/OP	O	5V	ROM/RAM BANK ADDRESS BUS 5
128	RBA6/IOP96	I	5V	NOT USED(LOW FIXED)
129	IOP95	I	5V	NOT USED(LOW FIXED)
130	IOP94	I	5V	INPUT PORT(STATUS1)
131	IOP93	I	5V	INPUT PORT(STATUS2)
132	XRESET	I	5V	RESET INPUT
133	XORESET	O	5V	RESET OUTPUT
134	VDD(5V)		5V	POWER SOURCE(+5V)
135	VSS		GND	POWER SOURCE(GND)
136	XRESETI	I	5V	RESET INPUT
137	XWDERR	O	5V	WATCHED ERROR OUTPUT SIGNAL
138	XRSTSWI/IP83	I	5V	NOT USED(HIGH FIXED)
139	XRSTSWO/OP82	O	5V	NOT USED
140	XRESETO	O	5V	NOT USED
141	IOP57	I	5V	INPUT PORT(JOG2)
142	STB1	O	5V	NOT USED
143	STB2	O	5V	NOT USED
144	VDD(3.3V)		3.3V	POWER SOURCE(+3.3V)
145	VSS		GND	POWER SOURCE(GND)
146	STB3	O	5V	NOT USED
147	STB4	O	5V	NOT USED
148	STBNP	I	5V	INPUT PORT(JOG1)
149	THDAT	O	5V	NOT USED
150	THCLK	O	5V	NOT USED
151	THLAT	O	5V	NOT USED
152	RM0/IOP00	O	5V	OUTPUT PORT(STATUS3)
153	RM1/IOP01	O	5V	OUTPUT PORT(STATUS4)
154	RM2/IOP02	O	5V	NOT USED
155	RM3/IOP03	O	5V	NOT USED
156	RXE/IOP04	I	5V	NOT USED(HIGH FIXED)
157	TM0/IOP10	O	5V	OUTPUT PORT(RESET)
158	VDD(5V)		5V	POWER SOURCE(+5V)
159	VSS		GND	POWER SOURCE(GND)
160	TM1/IOP11	O	5V	OUTPUT PORT(SPMUTE)
161	TM2/IOP12	O	5V	NOT USED
162	TM3/IOP13	O	5V	NOT USED
163	TXE/IOP14	I	5V	NOT USED(HIGH FIXED)
164	KSTART	O	5V	OPERATION PANEL CONTROL
165	KLATCH	O	5V	OPERATION PANEL CONTROL
166	KSCLK	O	5V	OPERATION PANEL CONTROL
167	KTXD	O	5V	OPERATION PANEL CONTROL
168	KRXD	I	5V	OPERATION PANEL CONTROL
169	ADSEL1	O	5V	NOT USED
170	VSSC		GND	POWER SOURCE(ANALOG GND)
171	VDDC		3.3V	POWER SOURCE(ANALOG +3.3V)
172	VSSA		GND	POWER SOURCE(ANALOG GND)
173	VDDA		3.3V	POWER SOURCE(ANALOG +3.3V)
174	VREFB	A	3.3V	A/D CONVERTER'S ZERO STANDARD VOLTAGE OUTPUT
175	VCL	A	3.3V	ANALOG PART STANDARD VOLTAGE SIGNAL
176	VREFT	A	3.3V	A/D CONVERTER'S FULL SCALE VOLTAGE OUTPUT

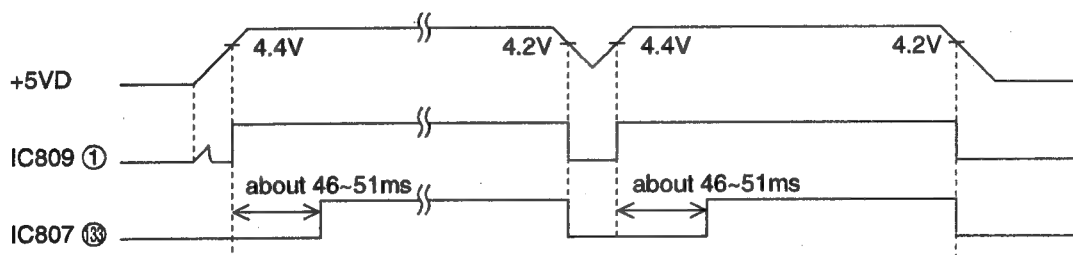
3.2 RESET CIRCUIT (WATCH DOG TIMER)

The output signal from pin 1 of the voltage detect IC (IC809) is input to the ASIC (IC807) 136 pin. Then the output signal from pin 133 of the ASIC (IC807) resets the ASIC.

Circuit Diagram



1. During a momentary power interruption, a positive reset pulse of 46~51 msec is generated and the system is reset completely.



2. When pin 132 and 133 of IC807 become low level, they will prohibit the SRAM (IC805) from changing data. The SRAM (IC805) will go into the backup mode, when they are backed up by a lithium battery.
3. The watch dog timer, built-in the ASIC (IC807), is initialized by the CPU about every 1.5 ms. When a watch dog error occurs, pin 137 of the ASIC (IC807) becomes low level. The terminal of the $\overline{\text{WDERR}}$ signal is connected to the reset line, so the $\overline{\text{WDERR}}$ signal works as the reset signal.

3.3 SRAM AND RTC BACK UP CIRCUIT

1) Function

This unit has a lithium battery (BATT) which works for the SRAM (IC805) and Real Time Clock IC (RTC: inside IC807).

The user parameters for autodial numbers, the system setup data and so on are stored in the SRAM (IC805).

The RTC continues functioning, even when the power switch is OFF, backed up by a lithium battery.

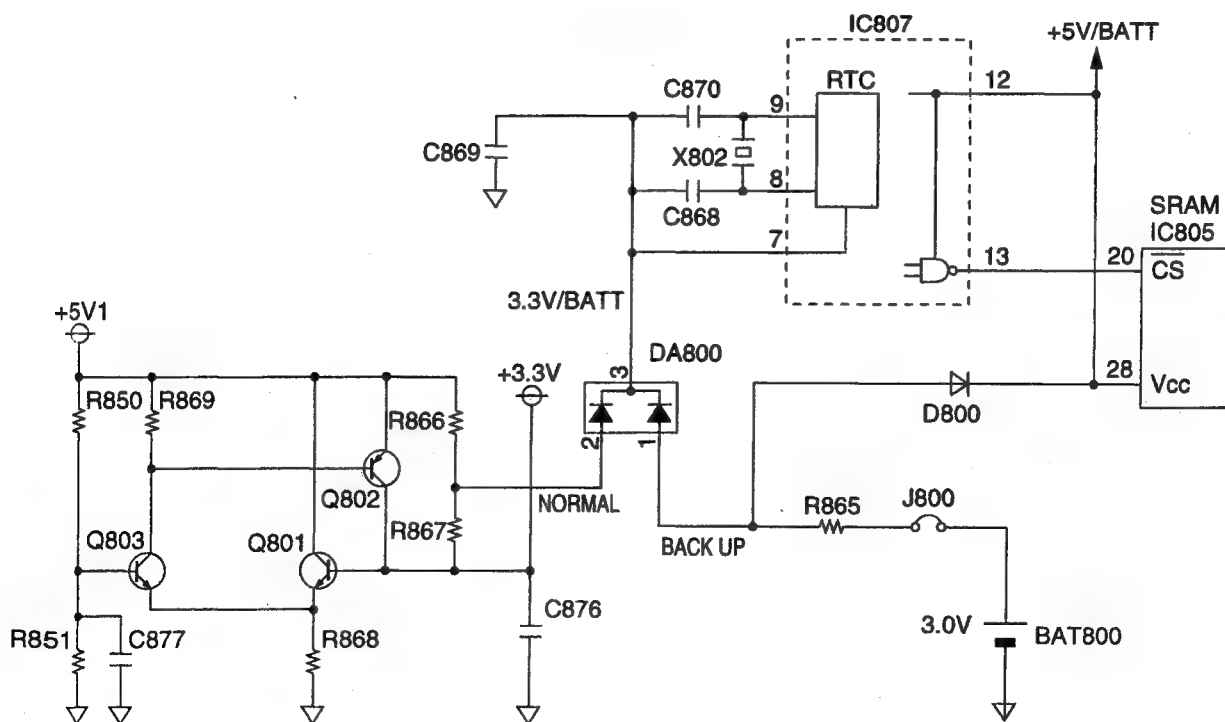
2) SRAM (IC805) Backup Circuit Operation

When the power switch is turned ON, power is supplied through pin 12 of IC807 to the SRAM (IC805). At this time, the voltage at pin 28 of the SRAM is 5V. When the power switch is turned OFF, the BATT supplies power to the SRAM through J801, R865 and D800. The voltage at pin 28 of the SRAM is about +2.5V. When the power switch is OFF and the voltage of +5V decreases, the voltage detect IC (IC809) outputs " Low " level and the IC807 outputs the reset signal. Pin 28 of the SRAM becomes roughly the same voltage as the battery voltage. At this point, pin 20 (CS) of IC805 becomes high level, causing the SRAM to go into the backup mode, in which the power consumption is lower.

3) RTC (IC807) Backup Circuit Operation

When the power switch is turned ON, power is supplied through DA800 to the RTC (inside IC807). At this time, the voltage at pin 7 of IC807 is +3.3V. When the power switch is turned OFF, the BATT supplies power to RTC through DA800. The voltage at pin 7 of IC807 is about +2.5V. When the power switch is OFF and the voltage of +3.3V decreases, pin 7 of RTC (IC807) becomes roughly the same voltage as the battery voltage. RTC goes into the backup mode, in which the power consumption is lower.

Circuit Diagram



3.4 MODEM SECTION

3.4.1 FUNCTION

The unit uses a 1 chip modem (IC802), enabling it to act as an interface between the control section for FAX sending and receiving, and the telephone line. During a sending operation, the digital image signals are modulated and sent to the telephone line.

During a receiving operation, the analog image signals which are received via the telephone line are demodulated and converted into digital image signals. The communication format and procedures for FAX communication are standardized by CCITT. This 1 chip modem (IC802) has hardware which sends and detects all of the necessary signals for FAX communication.

It can be controlled by writing commands from the CPU (IC807: inside ASIC) to the register in the modem (IC802).

This modem (IC802) also sends DTMF signals, generates a call tone (from the speaker), and detects a busy tone and dial tones.

Overview of Facsimile Communication Procedures (CCITT Recommendation):

1) ON CCITT (International Telegraph and Telephone Consultative Committee)

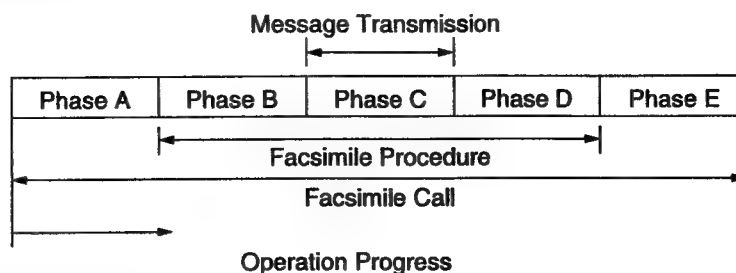
The No. XIV Group of CCITT, one of the four permanent organizations of the International Telecommunications Union (ITU), investigates and make recommendations on international standards for facsimiles.

2) Definition of Each Group

- Group I (G1)
Official A-4 size documents without using formats which reduce the band width of a signal are sent over telephone lines.
Determined in 1968.
Transmission for about 6 minutes at a scanning line density of 3.85 lines/mm.
- Group II (G2)
Using reduction technology in the modulation/demodulation format, an A-4 size document is sent at an official scanning line density of 3.85 lines/mm for about 3 minutes. Methods to suppress redundancy are not used.
Determined in 1976.
- Group III (G3)
Method of suppressing redundancy in the image signal prior to modulation is used. An A-4 size document is sent within about one minute. Determined in 1980.
- Group IV (G4)
Transmission is via the data network. A method is provided for suppressing redundancy in signals prior to transmission, and error-free reception of transmission is possible.
The scope of these facsimile applications is not limited simply to transmission of written statements. Through symbiotic linkages with other communication methods, it can be expected to expand to include integrated services.

3) Facsimile Call Time Series

As shown in the following diagram, the facsimile call time series is divided into five phases.

**Phase A: Call setting**

Call setting can be manual/automatic.

Phase B: Pre-message procedure

Phase B is a pre-processing procedure and sequence for the confirming the status of the terminal, transmission route, etc., and for terminal control. It executes terminal preparation status, determines and displays terminal constants, confirms synchronization status, prepares for transmission of facsimile messages, etc.

Phase C: Message transmission

Phase C is the procedure for the transmission of facsimile messages.

Phase D: Post message procedure

Phase D is the procedure for confirming that the message is completed and received. In the case of continuous transmission, phase B or phase C are repeated for transmission.

Phase E: Call retrieval

Phase E is the procedure for call retrieval, that is for circuit disconnection.

4) Concerning Transmission Time

$$\boxed{\text{Transmission Time}} = \boxed{\text{Control Time}} + \boxed{\text{Image Transmission Time}} + \boxed{\text{Hold Time}}$$

Transmission time consists of the following.

Control time: This is time at the start of transmission when the functions at the sending and receiving sides are confirmed, the transmission mode is established, and transmission and reception are synchronized.

Image transmission time:

This is the time required for the transmission of document contents (image data). In general, this time is recorded in the catalog, etc.

Hold time: This is the time required after the document contents have been sent to confirm that the document was actually sent, and to check for telephone reservations and/or the existence of continuous transmission.

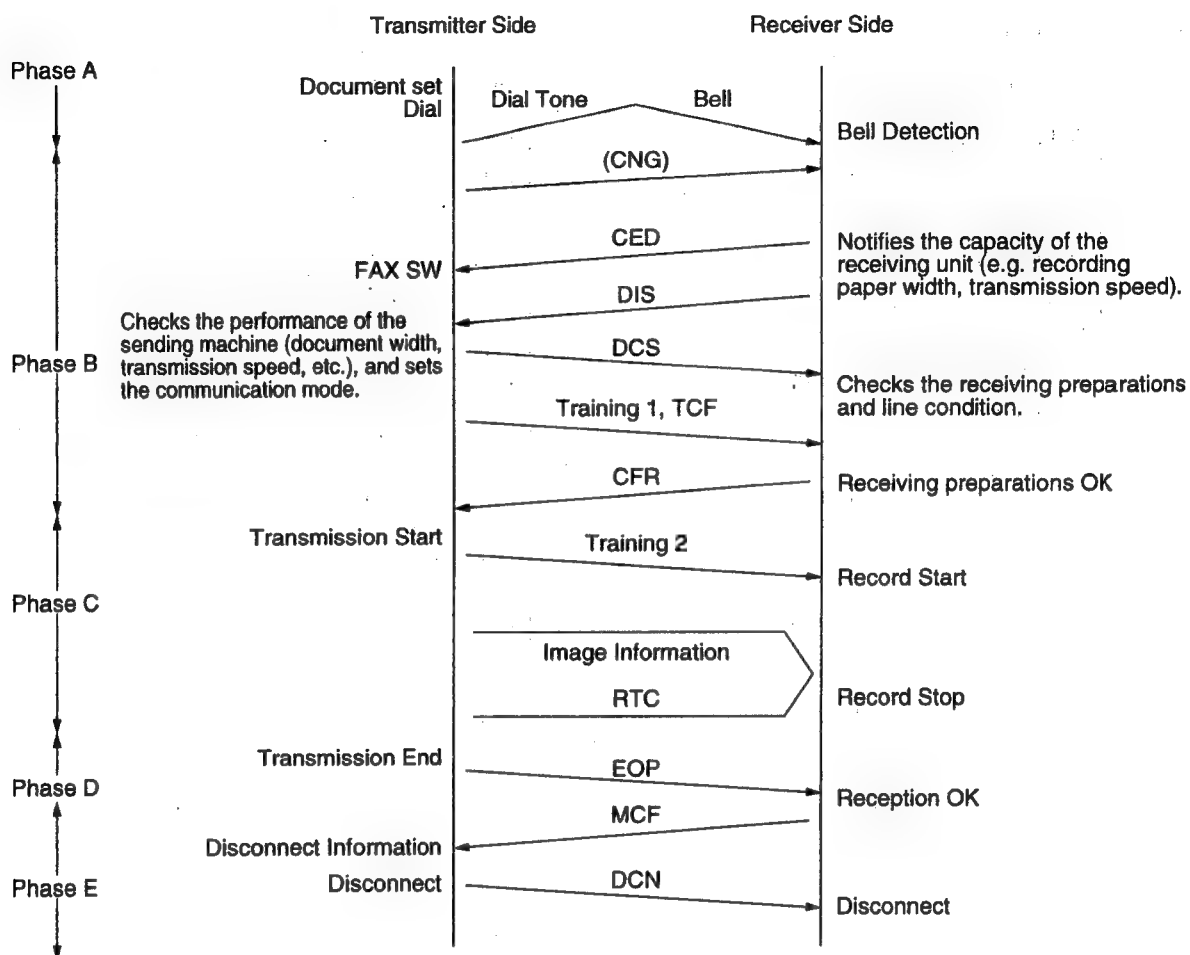
5) Facsimile Standards

Item	Telephone Network Facsimile
	G3 Machine
Connection Control Mode	Telephone Network Signal Mode
Terminal Control Mode	T. 30 Binary
Facsimile Signal Format	Digital
Modulation Mode	PSK (V. 27 ter) or QAM (V. 29)
Transmission Speed	300 bps (Control Signal) 2400, 4800, 7200, 9600, 12000, 14400 bps (FAX Signal)
Redundancy Compression Process (Coding Mode)	1 dimension : MH Mode 2 dimension : MR Mode (K=2.4)
Resolution	Main Scan : 8 pel/mm Sub Scan : 3.85, 7.7l/mm
Line Synchronization Signal	EOL Signal
1 Line Transmission Time [ms/line]	Depends on the degree of data reduction. Minimum Value : 10, 20 Can be recognized in 40ms.

6) Explanation of Technology

(1) G3 Communication Signals (T. 30 Binary Process)

For G3 Facsimile communication, this is the procedure for exchanging control signals between the sending and receiving machines both before and after transmission of image signals.



Control signals at 300 bps FSK are: 1850 Hz...0, 1650Hz...1.

An example of a binary process in G3 communication is shown below.

Explanation of Signals

Control signals are comprised mainly of 8-bit identification signals and the data signals added to them. Data signals are added to DIS and DCS signals.

Signal.....DIS (Digital Identification Signal)

Identification Signal Format.....00000001

Function:

Notifies the capacity of the receiving unit.

The added data signals are as follows.

(Example)

Signal.....DCS (Digital Command Signal)

Identification Signal Format.....X1000001

(Example)

Note: Some models do not support the following items.

Bit No.	DIS/DTC	DCS
1	Transmitter --- T.2 operation	
2	Receiver --- T.2 operation	Receiver --- T.2 operation
3	T.2 IOC = 176	T.2 IOC = 176
4	Transmitter --- T.3 operation	
5	Receiver --- T.3 operation	Receiver --- T.3 operation
6	Reserved for future T.3 operation features	

Bit No.	DIS/DTC	DCS
7	Reserved for future T.3 operation features.	
8	Reserved for future T.3 operation features.	
9	Transmitter --- T.4 operation	
10	Receiver --- T.4 operation	Receiver --- T.4 operation
11, 12, 13, 14	Data signaling rate	Data signaling rate
0, 0, 0, 0	V.27 <i>ter</i> fall back mode	2400 bit/s, V.27 <i>ter</i>
0, 1, 0, 0	V.27 <i>ter</i>	4800 bit/s, V.27 <i>ter</i>
1, 0, 0, 0	V.29	9600 bit/s, V.29
1, 1, 0, 0	V.27 <i>ter</i> and V.29	7200 bit/s, V.29
0, 0, 1, 0	Not used	14400 bit/s, V.33
0, 1, 1, 0	Reserved	12000 bit/s, V.33
1, 0, 1, 0	Not used	Reserved
1, 1, 1, 0	V.27 <i>ter</i> and V.29 and V.33	Reserved
0, 0, 0, 1	Not used	14400 bit/s, V.17
0, 1, 0, 1	Reserved	12000 bit/s, V.17
1, 0, 0, 1	Not used	9600 bit/s, V.17
1, 1, 0, 1	V.27 <i>ter</i> and V.29 and V.33 and V.17	7200 bit/s, V.17
0, 0, 1, 1	Not used	Reserved
0, 1, 1, 1	Reserved	Reserved
1, 0, 1, 1	Not used	Reserved
1, 1, 1, 1	Reserved	Reserved
15	R8×7.7 lines/mm and/or 200×200 pels/25.4mm	R8×7.7 lines/mm and/or 200×200 pels/25.4mm
16	Two-dimensional coding capability	Two-dimensional coding capability
17, 18	Recording width capabilities	Recording width
(0, 0)	1728 picture elements along scan line length of 215 mm ± 1%	1728 picture elements along scan line length of 215 mm ± 1%
(0, 1)	1728 picture elements along scan line length of 215 mm ± 1%	2432 picture elements along scan line length of 303 mm ± 1%
	2048 picture elements along scan line length of 255 mm ± 1%	
	2432 picture elements along scan line length of 303 mm ± 1%	
(1, 0)	1728 picture elements along scan line length of 215 mm ± 1%	2048 picture elements along scan line length of 255 mm ± 1%
	2048 picture elements along scan line length of 255 mm ± 1%	
(1, 1)	Invalid	Invalid
19, 20	Maximum recording length capability	Maximum recording length
(0, 0)	A4 (297 mm)	A4 (297 mm)
(0, 1)	Unlimited	Unlimited
(1, 0)	A4 (297 mm) and B4 (364 mm)	B4 (364 mm)
(1, 1)	Invalid	Invalid
21, 22, 23	Minimum scan line time capability of the receiver	Minimum scan line time
(0, 0, 0)	20 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$	20 ms
(0, 0, 1)	40 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$	40 ms
(0, 1, 0)	10 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$	10 ms
(1, 0, 0)	5 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$	5 ms
(0, 1, 1)	10 ms at 3.85 l/mm: $T_{7.7} = 1/2 T_{3.85}$	
(1, 1, 0)	20 ms at 3.85 l/mm: $T_{7.7} = 1/2 T_{3.85}$	
(1, 0, 1)	40 ms at 3.85 l/mm: $T_{7.7} = 1/2 T_{3.85}$	
(1, 1, 1)	0 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$	0 ms
24	Extend field	Extend field
25	2400 bit/s handshaking	2400 bit/s handshaking

Bit No.	DIS/DTC	DCS
26	Uncompressed mode	Uncompressed mode
27	Error correction mode	Error correction mode
28	Set to "0".	Frame size 0 = 256 octets 1 = 64 octets
29	Error limiting mode	Error limiting mode
30	Reserved for G4 capability on PSTN	Reserved for G4 capability on PSTN
31	T.6 coding capability	T.6 coding enabled
32	Extend field	Extend field
33 (0) (1)	Validity of bits 17, 18 Bits 17, 18 are valid Bits 17, 18 are invalid	Recording width Recording width indicated by bits 17, 18 Recording width indicated by this field bit information
34	Recording width capability 1216 picture elements along scan line length of $151 \pm \text{mm } 1\%$	Middle 1216 elements of 1728 picture elements
35	Recording width capability 864 picture elements along scan line length of $107 \pm \text{mm } 1\%$	Middle 864 elements of 1728 picture elements
36	Recording width capability 1728 picture elements along scan line length of $151 \pm \text{mm } 1\%$	Invalid
37	Recording width capability 1728 picture elements along scan line length of $107 \pm \text{mm } 1\%$	Invalid
38	Reserved for future recording width capability.	
39	Reserved for future recording width capability.	
40	Extend field	Extend field
41	$R8 \times 15.4$ lines/mm	$R8 \times 15.4$ lines/mm
42	300×300 pels/25.4 mm	300×300 pels/25.4 mm
43	$R16 \times 15.4$ lines/mm and/or 400×400 pels/25.4 mm	$R16 \times 15.4$ lines/mm and/or 400×400 pels/25.4 mm
44	Inch based resolution preferred	Resolution type selection "0" : metric based resolution "1" : inch based resolution
45	Metric based resolution preferred	Don't care
46	Minimum scan line time capability for higher resolutions "0" : $T_{15.4} = T_{7.7}$ "1" : $T_{15.4} = 1/2 T_{7.7}$	Don't care
47	Selective Polling capability	Set to "0".
48	Extend field	Extend field

Note 1 - Standard facsimile units conforming to T.2 must have the following capability : Index of cooperation (IOC)=264.

Note 2 - Standard facsimile units conforming to T.3 must have the following capability : Index of cooperation (IOC)=264.

Note 1 - Standard facsimile units conforming to T.4 must have the following capability : Paper length=297 mm.

Signal	Identification Signal Format	Function
Training 1	_____	A fixed pattern is transmitted to the receiving side at a speed (2400 to 9600 bps) designated by DCS, and the receiving side optimizes the automatic equalizer, etc., according to this signal.

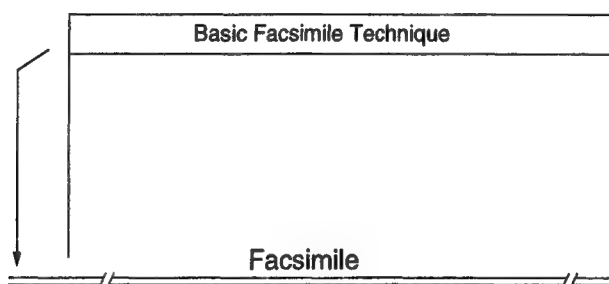
KX-FLM600G

Signal	Identification Signal Format	Function
TCF (Training Check)	_____	Sends 0 continuously for 1.5 seconds at the same speed as the training signal.
CFR (Confirmation to Receive)	X0100001	Notifies the sending side that TCF has been properly received. If TCF is not properly received, FTT (Failure To Train) X0100010 is relayed to the sender. The sender then reduces the transmission speed by one stage and initiates training once again.
Training 2	_____	Used for reconfirming the receiving side like training 1.
Image Signal	Refer to the next page.	_____
RTC (Return to Control)	_____	Sends 12 bits (0...01 × 6 times) to the receiver at the same speed as the image signal and notifies completion of transmission of the first sheet.
EOP (End of Procedure)	X1110100	End of one communication
MCF (Message Confirmation)	X0110001	End of 1 page reception
DCN (Disconnect)	X1011111	Phase E starts.
MPS (Multi-Page Signal)	X1110010	Completion of transmission of 1 page. If there are still more documents to be sent, they are output instead of EOP. After MCF reception, the sender transmits an image signal of the second sheet.
PRI-EOP (Procedural Interrupt-EOP)	X1111100	If there is an operator call from the sender, it is output after RTC.
PIP (Procedural Interrupt Positive)	X0110101	This is output when an operator call is received.

(2) Redundancy Compression Process Coding Mode

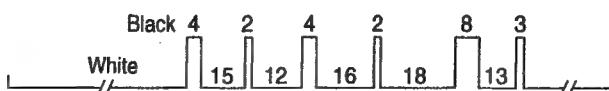
This unit uses one-dimensional MH format.

(a) Document



(b) Part of document

(c) Run length and image signals equivalent to (b)



(d) Codification of (c) according to MH formula

00110111101010 011 110101 11 001000 011 101010
(White 400) (Black 4) (White 15) (Black 2) (White 12) (Black 4) (White 16)

11 0100111 000101 000011 10
(Black 2) (White 18) (Black 8) (White 13) (Black 3)

(c) Total bit number before MH codification (497 bit)

(d) Total bit number after MH codification (63 bit)

Modified Huffman (MH) Code		
Run length	Code for White Line	Code for Black Line
0	00110101	000011011
1	000111	010
2	0111	11
3	1000	10
4	1011	011
5	1100	0011
6	1110	0010
7	1111	00011
8	10011	000101
9	10100	000100
10	00111	0000100
11	01000	0000101
12	001000	0000111
13	000011	00000100
14	110100	00000111
15	110101	000011000
16	101010	0000010111
17	101011	0000011000
18	0100111	0000010000

3.4.2 MODEM CIRCUIT OPERATION

The modem (IC802) has all the hardware satisfying the ITU-T standards mentioned previously.

When the ASIC IC807 (77) is brought to a low level, the modem (IC802) is chip-selected and the resistors inside IC are selected by the select signals from ASIC (IC807) ADR0-ADR4. The commands are written through the data bus, and all the processing is controlled by the ASIC (IC807) according to ITU-T procedures. The INT signal dispatched from IRQ1, 2 (pin 108 and 121 of IC802) to ASIC (IC807) when the transmission data is accepted and the received data is demodulated, the ASIC (IC807) implements post processing. This modem (IC802) has an automatic application equalizer. With training signal 1 or 2 during G3 reception, it can automatically establish the optimum equalizer. The modem (IC802) operates using the 32.256 MHz clock (X800).

1) Facsimile Transmission

The digital image data on the data bus is modulated in the modem (IC802), and sent from pin 69 via analog ASIC (IC811) and the NCU section to the telephone line.
(See page 92,93)

2) Facsimile Reception

The analog image data which is received from the telephone line passes through the NCU section and enters pin 60 of the modem (IC802). The signals that enter pin 60 of the modem (IC802) are demodulated in the board to digital image signals, then placed on the data bus.

In this case, the image signals from the telephone line are transmitted serially. Hence, they are placed on the bus in 8 bit units. Here, the internal equalizer circuit reduces the image signals to a long-distance receiving level.

This is designed to correct the characteristics of the frequency band centered about 3 kHz and maintain a constant receiving sensitivity. It can be set in the service mode.

(See page 92,93)

3) DTMF Transmission (Monitor tone)

The DTMF signal generated in the modem (IC802) is output from pin 69, and is then sent to the circuit on the same route as used for facsimile transmission.

(See page 92,93)

(DTMF Monitor Tone)

4) Call Tone Transmission

This is the call signal which is generated in the ASIC (IC807) and sent to the speaker. (See page

(See page 92,93)

5) Busy/Dial Tone Detection

The path is the same as FAX receiving. When it is detected, the carrier detect bit of the resistor in the modem (IC802) becomes 1, and this status is monitored by the ASIC (IC807).

(See page 92,93)

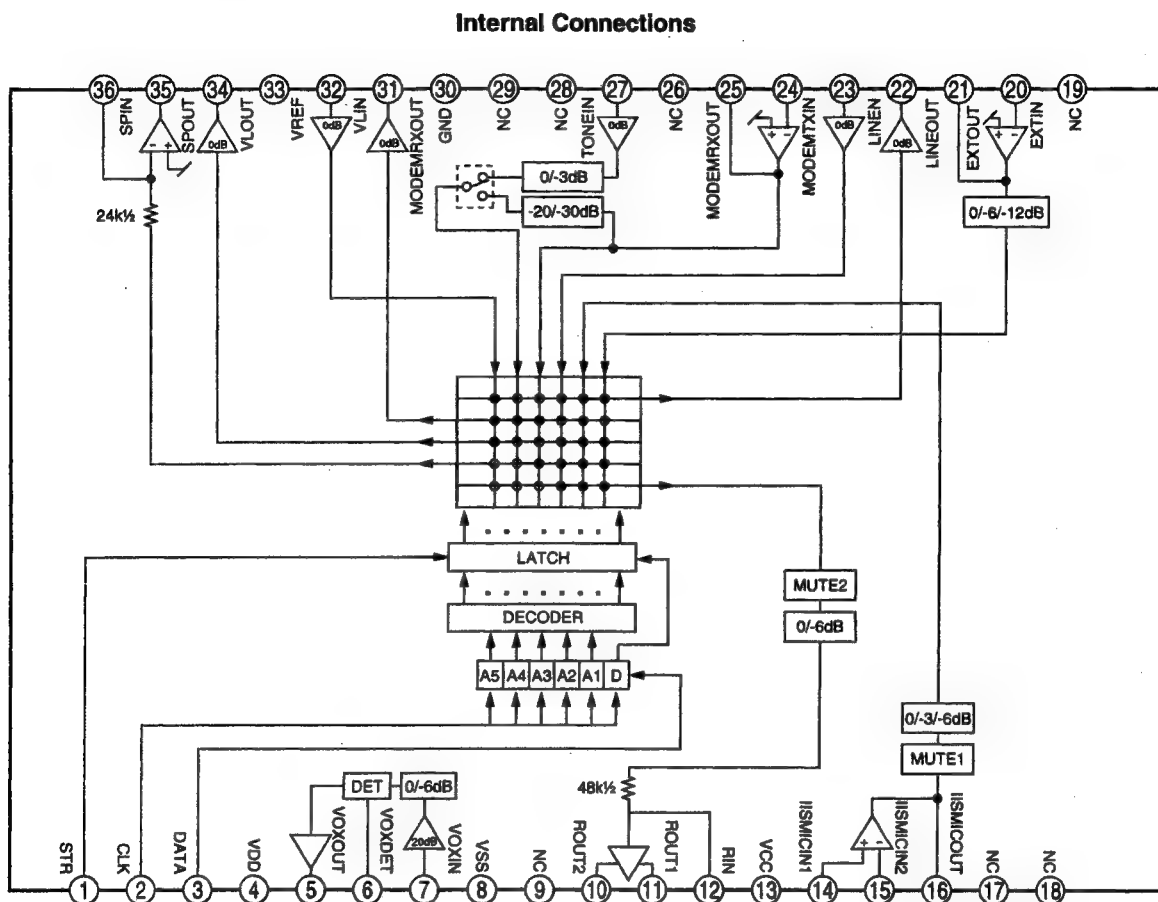
3.5 ANALOG SECTION

3.5.1 ANALOG GATE ARRAY (IC811 on the Digital Board)

This IC can perform signal route switching and level adjustments for various types of analog signals.

This IC incorporates a cross-point switch (CPS), an electronic volume, an auto level controller (ALC) circuit for recording and an attenuation circuit.

The CPS of this IC is controlled by sending data from digital ASIC.



Explanation of ANALOG GATE ARRAY (IC811 on the DIGITAL Board)

No.	Name	Function	No.	Name	Function
1	STR	Strobe input	19	NC	Not used
2	CLOCK	Clock input	20	EXTIN	EXT amp output
3	DATA	Data input	21	EXTOUT	EXT amp input
4	VDD	Logic power supply	22	LINEOUT	Line amp output
5	VOXOUT	VOX output	23	LINEIN	Line amp input
6	VOXDET	VOX detection adjustment	24	MODEMTXIN	MODEM TX amp input
7	VOXIN	VOX input	25	MODEMTXOUT	MODEM TX amp output
8	VSS	Logic ground	26	NC	Not used
9	NC	Not used	27	TONEIN	Tone amp input
10	ROUT2	HS receiver amp output2	28	NC	Not used
11	ROUT1	HS receiver amp output1	29	NC	Not used
12	RIN	HS receiver amp input	30	GND	Analog ground
13	VCC	Analog ground	31	MODEMRXOUT	MODEM RX amp output
14	HSMICIN1	HS mic amp input1	32	VLIN	Volume amp input
15	HSMICIN2	HS mic amp input2	33	VREF	reference voltage output
16	HSMICOUT	HS mic amp output	34	VLOUT	Volume amp output
17	NC	Not used	35	SPOUT	Speaker amp output
18	NC	Not used	36	SPIN	Speaker amp input

3.5.2 DESCRIPTION OF BLOCK DIAGRAM IN ANALOG SECTION**1) Function**

The analog section works as an interface between the telephone line.

The analog ASIC (IC811) on the digital board exchanges FAX TX and RX signals between the MODEM (IC802) and the analog section.

The control signals transmitted to the analog section are output mainly from ASIC IC807, and the analog status is stored as data in ASIC IC807.

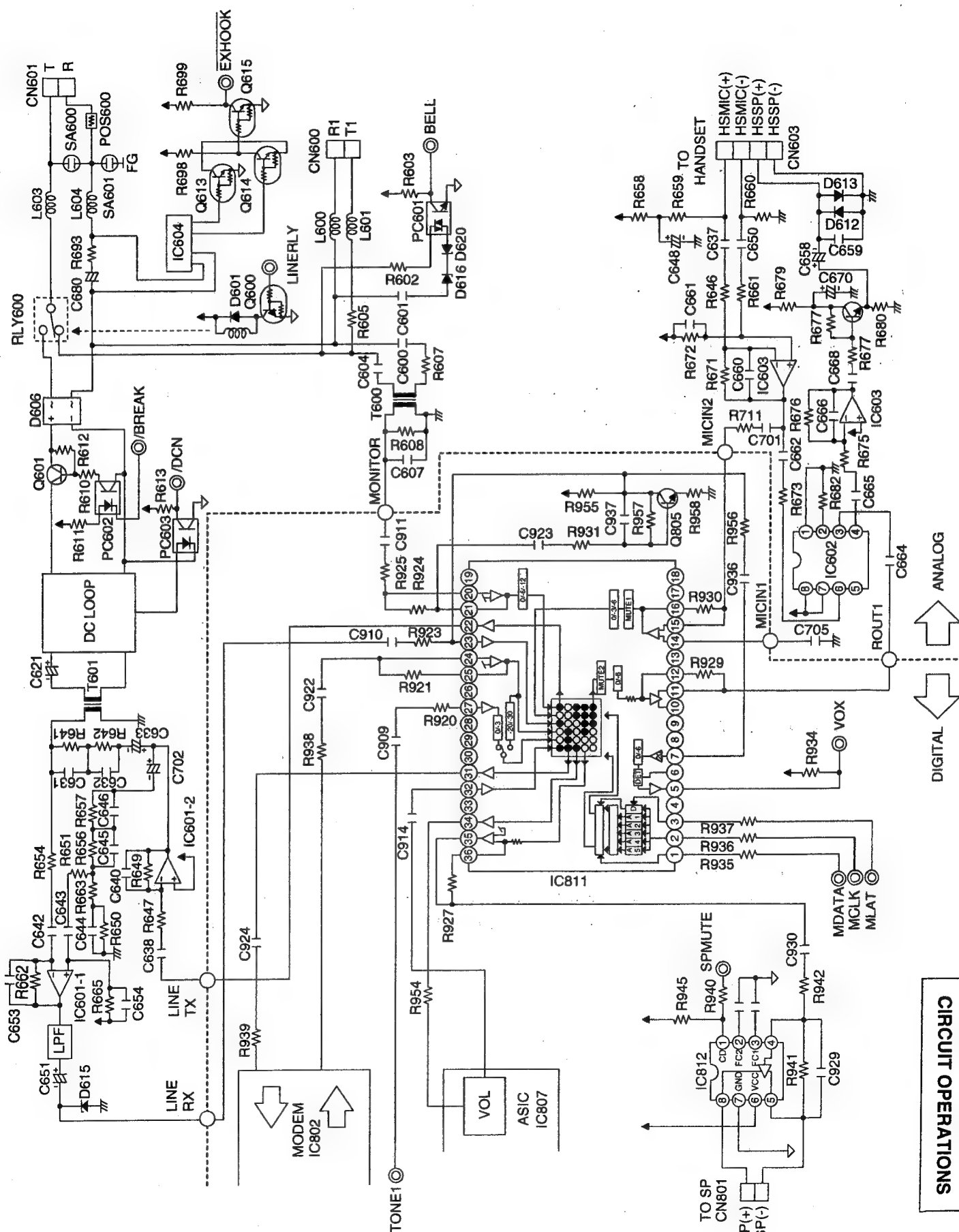
2) Circuit Operation

[NCU]:Network Control Unit

The NCU comprises of the following; DC loop forming circuit to connect with the telephone line; Switching circuit for other interconnected telephones; Bell detection circuit; Pulse dial generation circuit; Extension phone line off-hook detection circuit; Sidetone circuit; Remote fax activation circuit.

Refer to **NCU SECTION** for the details.

Block Diagram



3.6 NCU SECTION**3.6.1 GENERAL**

This section is the interface between the telephone line and external telephone. It is composed of an EXT. TEL line relay (RLY600), bell detection circuit, pulse dial circuit, TAM interface circuit, line amplifier and sidetone circuits and a multiplexer.

3.6.2 EXT. TEL. LINE RELAY (RLY600)**1. Circuit Operation**

Normally, this relay switches to the external telephone side (break) and switches to the open side (make) while OFF-HOOK.

{ IC807 (17) High Level → CN800 (16) High Level } → CN602 (16) High Level → Q600 ON → RLY600 (make)

3.6.3 BELL DETECTION CIRCUIT**1. Circuit Operation**

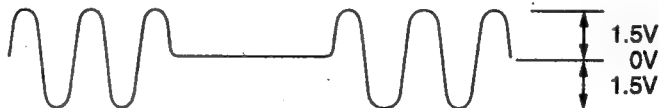
The signal waveform for each point is indicated below. The signal (low level section) input to pin 19 of ASIC IC807 on the digital board is read by ASIC and judged as a bell.

TEL LINE → PC601 (1, 2 - 4) → IC807 (19)

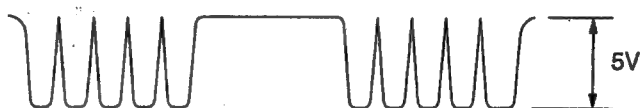
Between the Tip and Ring
from the telephone line



Between PC601 (1) and (2)



PC601 (4)/ASIC IC807 (19)

**3.6.4 TAM INTERFACE CIRCUIT**

This circuit is to switch between FAX receiving and the external TAM's message recording automatically. This circuit consists of an EXT. TAM OFF-HOOK detect circuit, monitor transformer, multiplexer, amplifier, and VOX detect circuit.

For details, please refer to 3.9. TAM INTERFACE SECTION.

3.6.5 LINE AMPLIFIER AND SIDE TONE CIRCUIT

Circuit Operation

The reception signal output from the line transformer T601 is input to pin (2) of IC601 via R654, C642 and R663, and then the signal is amplified at pin (1) of IC601 and sent to the reception system 5.9dB.

The transmission signal goes through C638, R714, R647 and enters IC601 pin(6), where the signal is amplified to about 17.7dB.

Then, it is output from pin (7) of IC601 and transmitted to T601 via C633, R642 and R641.

If the side tone circuit is not applied, the transmission signal will return to the reception amplifier via C702, R657, R655, R651 and C643. When the side tone circuit is active, the signal output from IC601 pin(7) passes through C702, R657, R655, R651, C643, R664 and goes into the amplifier IC601 pin (3).

This circuit is used to cancel the transmission return signal.

The TX signal is output to the circuit analog the route from the IC601 7pin → C633 → R642 → R641 → T601 → TEL LINE. However, if balance is lost in the bridge, a voltage occurs between the IC601 2pin and 3pin and a sidetone results. Because the balance cannot be maintained completely at all frequencies in the audio range, some sidetone always occur.

3.6.6 REMOTE FAX ACTIVATION CIRCUIT

(1) Function

Another telephone connected to same line activates the unit to the FAX mode by using a DTMF signal.

(2) Signal Path

TEL Line → T600 → C911 → R925 → IC811(20-31) → C924 → R939 → IC802(60)

3.7 ITS (Integrated telephone System) and MONITOR SECTION

3.7.1 GENERAL

The general ITS operation is performed by the special IC802 which has a handset circuit. The alarm tone, the key tone, and the beep are output from the ASIC IC807 (digital board). During the pulse dial operation, the monitor tone is output from the ASIC IC807.

3.7.2 TELEPHONE MONITOR

1. Function

This is the function when you are not holding the handset and can hear the caller's voice from the line.

2. Signal path

Refer to page 92, 93.

3.7.3 HANDSET CIRCUIT

1. Function

This circuit controls the conversation over the handset, i.e. the transmitted and received voices to and from the handset.

2. Signal path (Transmission signal)

Refer to page 92, 93.

3. Signal path (Reception signal)

Refer to page 92, 93.

3.7.4 MONITOR CIRCUIT

1. Function

This circuit monitors various tones, such as ① DTMF tone, ② Alarm/Beep/Key tone/Bell ③ Dummy ring back tone.

2. Signal path

a. DTMF MONITOR

(Speaker Operation)

Refer to page 92, 93.

(Handset Operation)

Refer to page 92, 93.

b. ALARM/BEEP/KEY TONE/BELL

Refer to page 92, 93.

c. DUMMY RING BACK TONE

Refer to page 92, 93.

3.8 AUTO DISCONNECT CIRCUIT

(1) Function

This circuit used to detect that the telephone connected in parallel to the same line is OFF-hook while the unit picks up the line. If this detection circuit is activated when TAM is being delivered, the delivery stops and the circuit is automatically released.

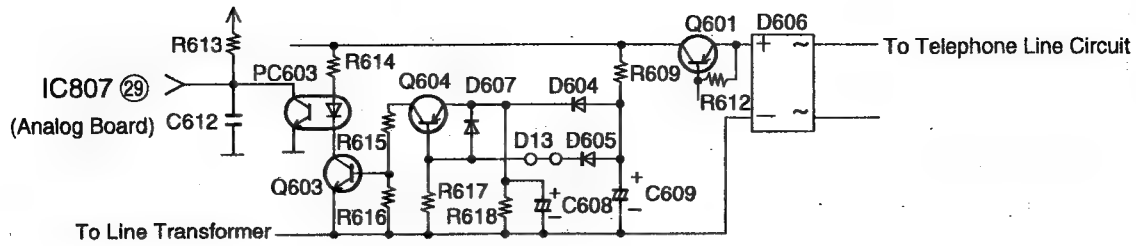
(2) Circuit Operation

If the line is picked up, C608 is charged by following the path shown below.

D606(+) → Q601 → R609 → D604 → C608

When the electric potential difference between the base and emitter of Q604 becomes less than about 0.3V, Q604 and Q603 and PC603 turn off, then the IC807 pin 29 becomes a high level.

In this condition, if a telephone connected in parallel goes into OFF-hook status, the base of Q604 becomes low. On the other hand, the emitter of Q604 goes down because the capacitor (C608) is charged. Q604 turns on when the electric potential difference between the base and emitter of Q604 becomes more than 0.6V while being charged. When Q604 turns on, Q603 and PC603 also turn on, then the IC807 pin 29 becomes a low level.



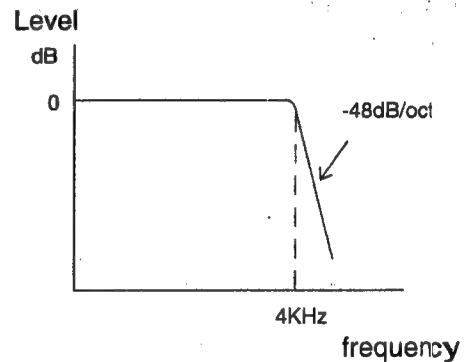
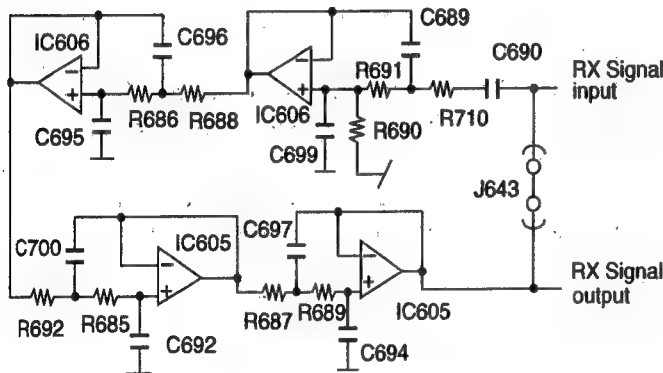
3.8.1 LOW PASS FILTER

(1) Function

This circuit is only incorporated in products intended for Germany. Non-German products are shorted by J643. This low pass filter attenuates the 16-kHz account signal from the commutator to eliminate influence on the conversation and communication.

(2) Circuit Operation

This low pass filter is an eight-order active filter, and the cutoff frequency is approximately 4 kHz.



3.8.2 SPECIAL CIRCUIT ON THE ANALOG BOARD

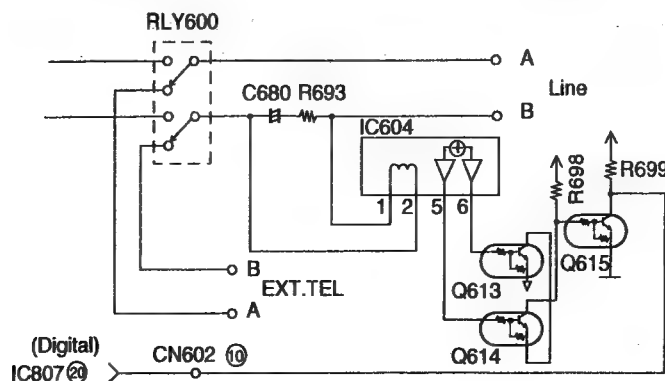
CURRENT DETECTION CIRCUIT

(1) Function

This circuit detects whether the circuit current is flowing or not. It is also used for CPC detection and Ext. Tel Hook detection.

(2) Circuit Operation

If a circuit current of 10 mA or more flows in the IC604 coil when the unit or Ext. Tel is OFF-hook, the IC604 internal sensor detects this current. Then depending on the direction of the current, the IC604-5 pin or 6 pin switches to a low level. Next, Q613 or Q614 is turned off, Q615 is turned on, and Gate Array IC807-20 pin on the digital board switches to a low level. If the line is cut off, the opposite operation is executed and the IC807-20 pin switches to a high level.



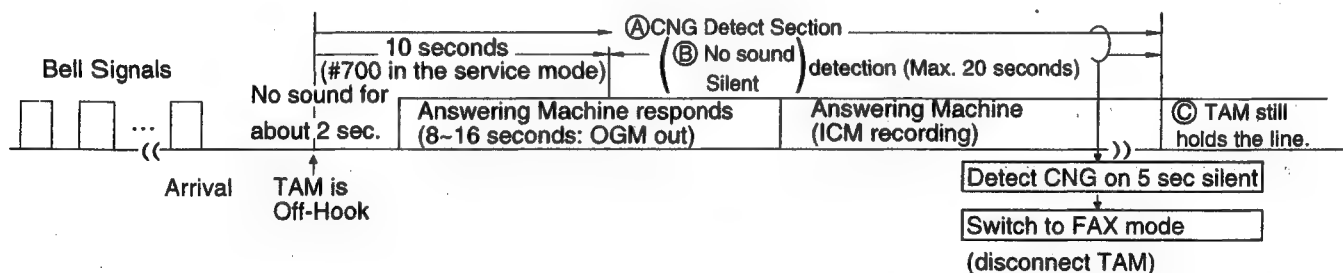
3.9 TAM INTERFACE SECTION

3.9.1 FUNCTION

If EXT. TAM is selected in the Receive mode, the unit receives documents for FAX calls or the external TAM records a voice message automatically.

To switch between the answering machine and facsimile in the EXT. TAM Mode.

#	EXTERNAL TAM OPERATION	UNIT OPERATION
1	When the bell signal rings as many times as the number installed in the connected answering machine (TAM), the answering machine seizes the line and the answering message is sent out to the line. (OGM out for 8 ~ 16 sec.)	The length of the answering message should be 8~16 seconds. While the message is being played, the unit starts to detect the CNG signal. (A) If the unit detects the CNG signal, it OK to FAX receiving and disconnects the external TAM automatically.
2	After sending the OGM, the answering machine starts to record the message of the other party (ICM recording).	After the OGM of the external TAM is finished, the unit starts to detect approximately 5 seconds of no sound detection. (B) If no sound is detected, the unit will switch to FAX receiving and disconnect the external TAM automatically. If the unit cannot detect the CNG signal or no sound for about 30 seconds, the unit will not hold the line. (C)



Attention 1: No sound detection lasts 20 seconds after the telephone call is received at the answering machine. If there is no sound for more than 5 seconds (#701 in the service mode), it switches to the facsimile.

Attention 2: When the answering machine cannot answer the telephone call because of disconnection or the recording tape is full, the unit picks up the call after 5 rings (#702 in the service mode). Then it switches to the facsimile.

3.9.1.1 CIRCUIT OPERATION

The TAM INTERFACE circuit consists of an EXT. TAM HOOK detection circuit, CNG signal from the other party's detection circuit, VOX detection circuit (to judge sound/no-sound) and RL101 (to separate EXT. TAM).

1. EXT. TAM HOOK detection circuit

A bell is received at EXT. TAM and EXT. TAM is connected to the line, making a DC LOOP. Then, IC604 detects this current. During detection, EX-HOOK1 becomes low.

(DC LOOP)

Tip → L603 → RLY600(3,2) → R605 → J634 → L601 → Tip1 → (EXT.TAM) → Ring 1 → L600 → RL600(7, 6) →
IC604(1,2) → L604 → POS600 → Ring

2. CNG signal detection circuit

The CNG signal from the other party's FAX is detected in MODEM IC802 (digital board).

(Signal path)

Refer to page 92, 93.

3. VOX

The VOX circuit detects if there is a signal or voice on the line. This is why the VOX circuit reacts to the OGM of the EXT.TAM and ICM from the other party.

(Signal path)

Telephone Line ———→ C604 → T600 → CN604(10) → {CN801(10) → C911 → R925 → IC811(20, 21) → C923 →
EXT.TEL Line → R605 ↑
R931 → Q805(B, C) → C936 → R956 → IC811(7, 5) → IC807(53)}

4. Remote receiving

This is the parallel-connected DTMF signal for the TEL or EXT.TEL mode between T and R. When the other party is a FAX, the unit switches to FAX receiving.

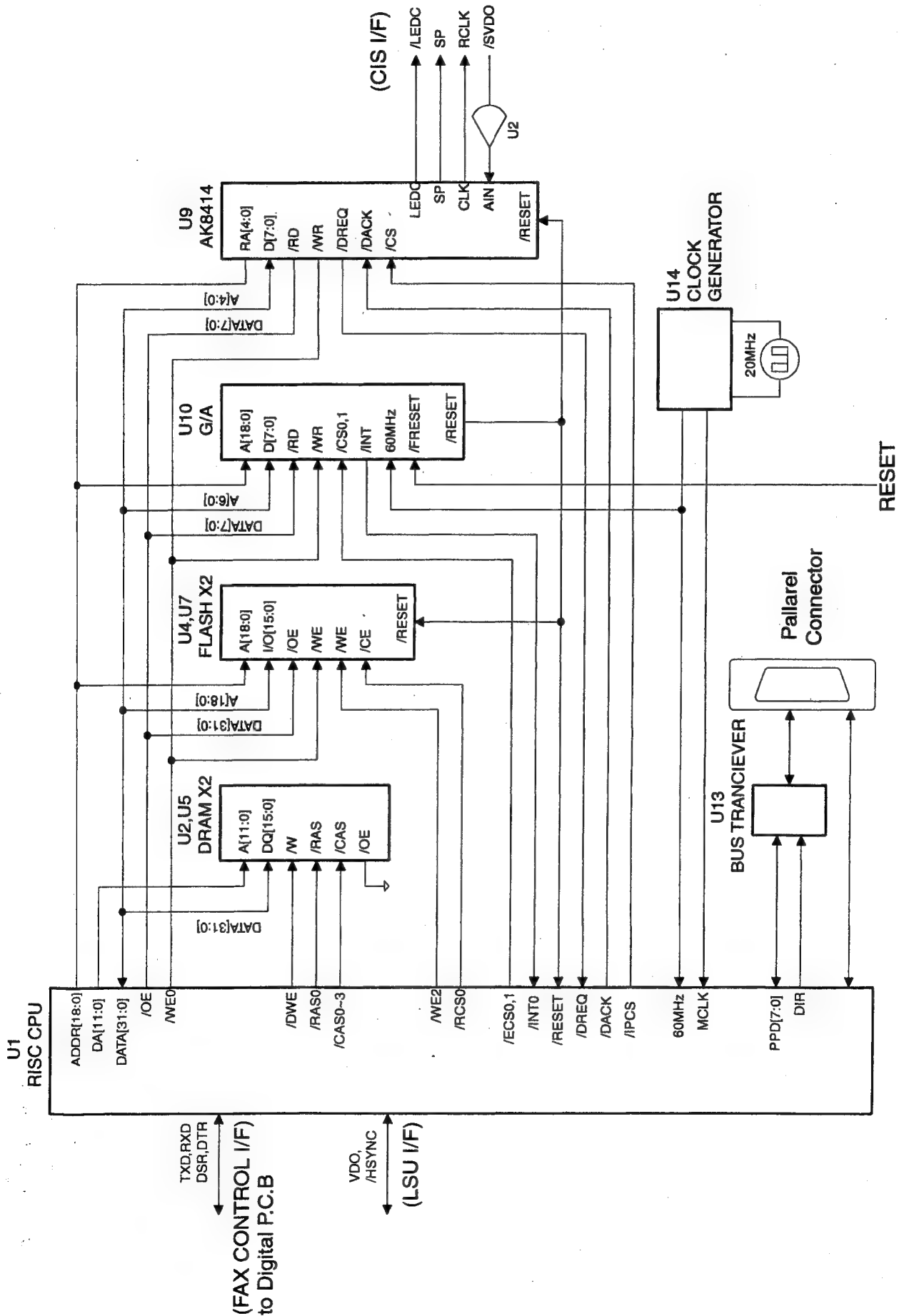
(Signal Path)

Detects the DTMF signal in the MODEM.

{ } : Inside the digital board

4. PRINTER CONTROLLER SECTION

Printing Controller Bord Block Diagram



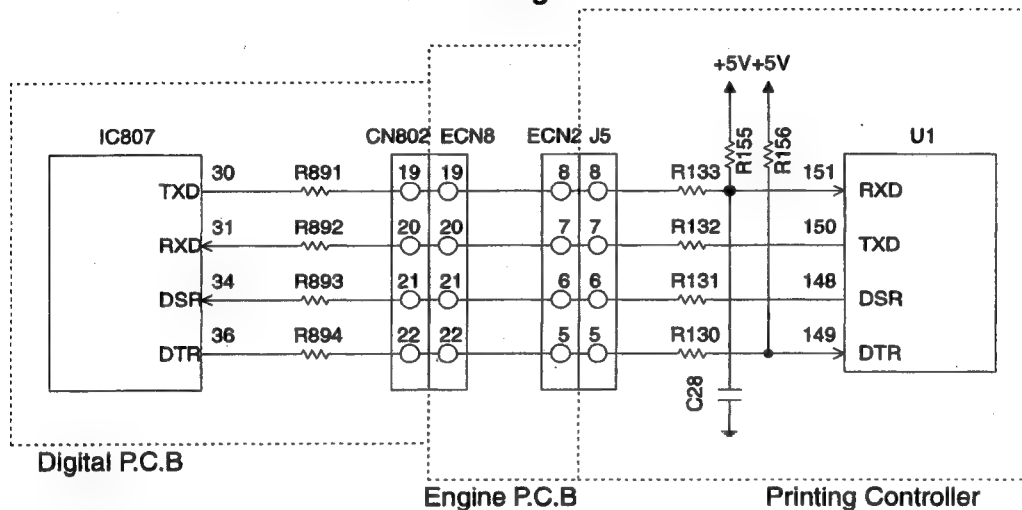
4.1. FAX CONTROL PRINTER CONTROLLER COMMUNICATION

Fax control section and printing controller communicate command, status and compressed image data each other by serial communication in conformance with the specifications of EIA standard No. RS-232C.

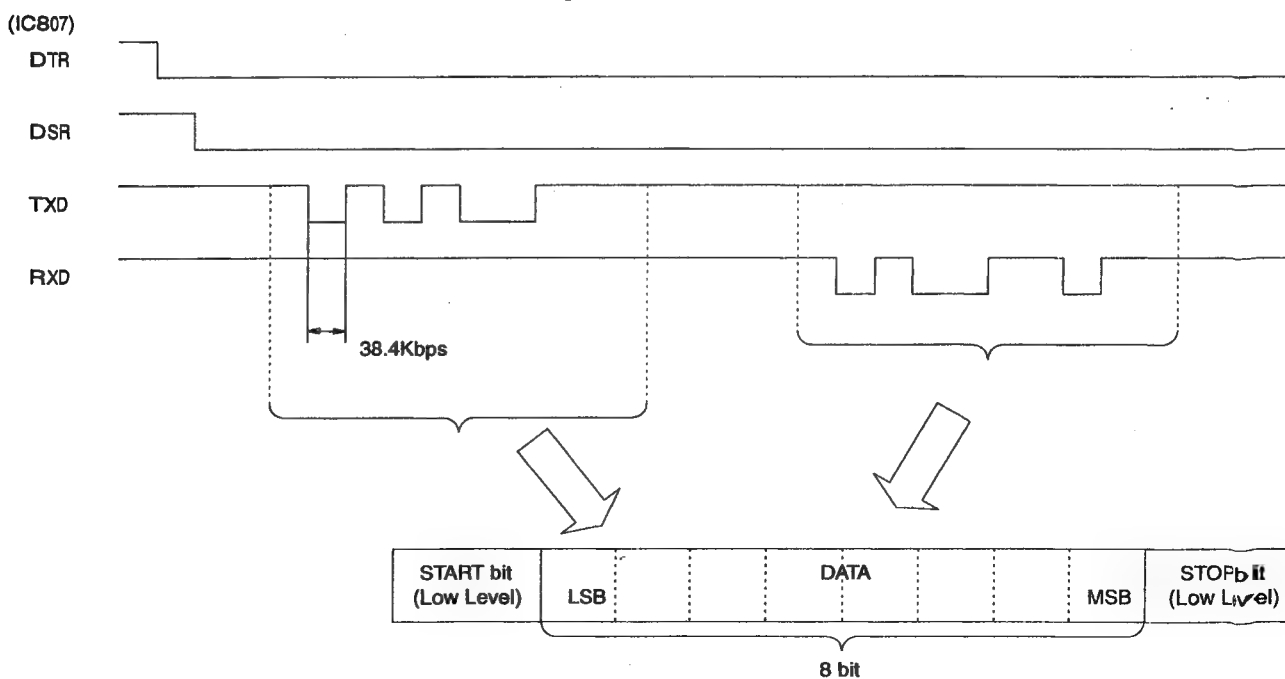
This communication speed is 38.4Kbps.

1 character consists of 1 start bit, 8bits data and 1 stop bit as shown below.

Circuit Diagram



Timing chart



4.2 PRINTER CONTROLLER BOARD

4.2.1 Overall block Diagram

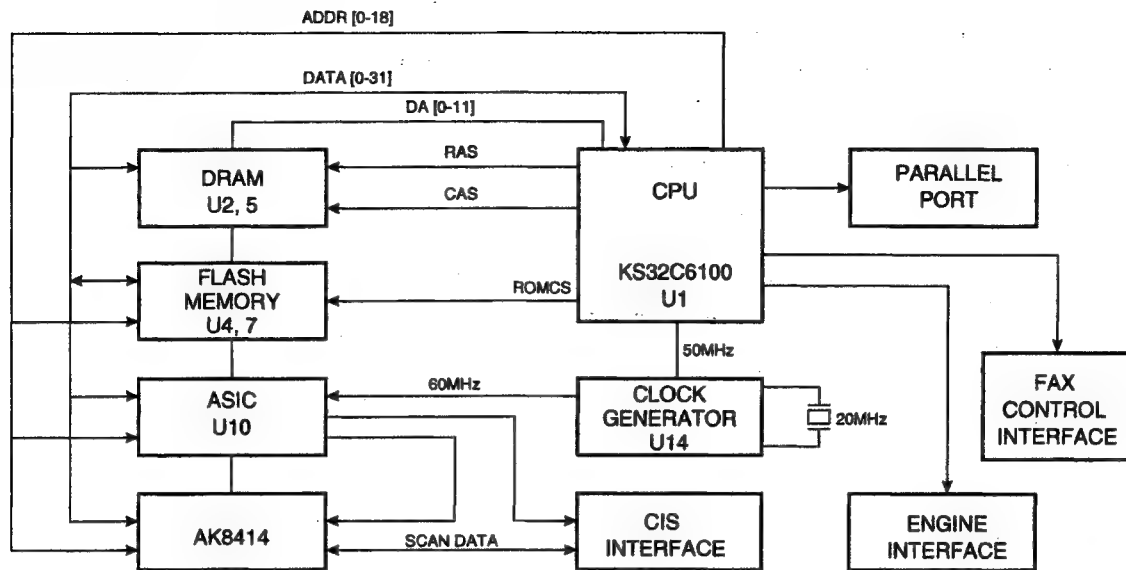


FIG. 4-8

● The printing controller board is comprised of the following.

- CPU (KS32C6100 32 BIT RISC MICROCONTROLLER)
- CLOCK GENERATOR
- DRAM
- FLASH MEMORY
- G/A
- IMAGE PROCESSOR (AK8414)

4.2.2 CPU (KS32C6100 32 BIT RISC MICROCONTROLLER)

4.2.2.1 Introduction

KS32C6100 16/32-bit RISC microcontroller provides a cost-effective and high-performance microcontroller solution for laser beam printers (LBP) with PCL/PDL interpreters. To accelerate raster image generation, the KS32C6100 directly processes scanned image data for the laser printer engine.

An outstanding feature of the KS32C6100 is its CPU core, a 16/32-bit RISC processor (ARM7TDMI) designed by Advanced RISC Machines, Ltd. The ARM7TDMI core is a low-power, general-purpose, microprocessor macrocell that was developed for use in application-specific and customer-specific integrated circuits. Its simple, elegant, and fully static design is particularly suitable for cost-sensitive and power-sensitive applications.

The KS32C6100 was developed using the ARM7TDMI core, 0.5- μ m standard cells, and a data path compiler. Most of the on-chip function blocks were designed using a HDL synthesizer.

By providing a complete set of common system peripherals, the KS32C6100 minimizes overall system costs and eliminates the need to configure additional components.

The main integrated on-chip function blocks which are described in this document include:

- ROM /SRAM /DRAM controller
- 4Kbyte Instruction /Data cache
- Three -channel DMA controller
- UART / Serial IO
- Parallel port interface controller (PPIC)
- Five 16-bit timers including tone generator and watch dog timer
- Printer interface controller (PIFC)
- Graphic engine unit (GEU)
- Image functional unit including image expander, image rotator, VIS and halftoner
- Programmable I/O ports
- Interrupt controller

4.2.2.2 FEATURES**Architecture**

- Completely integrated system for embedded applications, especially laser beam printers
- Fully 16/32-bit RISC architecture
- Efficient and powerful ARM7 TDMI CPU core
- 4-kbyte instruction/data cache
- External bus master mode support
- Cost-effective JTAG-based debug solution

Unified Cache

- 4-Kbyte unified cache
- 2-way set-associative configuration
- Two non-cacheable data regions can be specified
- Cache disable by software
- Four-word depth write buffer

System manager

- 256-Mbyte virtually addressable space support
- 8-bit, 16-bit, or 32-bit external bus support for ROM, SRAM, DRAM, and external I/O
- Separate address and control signals specially for DRAM access, and CAS before RAS refresh, DRAM self-refresh, fast page and EDO DRAM access modes support
- Programmable memory bank size and location definition to provide a flexible memory map.
- Programmable memory access times (2 to 7 waiting cycles)
- Cost-effective memory-to-peripheral interface

DMA

- Three -channel general-purpose DMA controller
- Memory-to-memory, serial Me port /from-memory, parallel port-to/from-memory data transfers without CPU intervention
- Run-length compression/decompression support for memory-to-memory data transfer in CDMA channel
- Initiated by software, peripherals or external DMA request
- Increment or decrement of source or destination addresses, and 8-bit (byte), 16-bit (half-word) or 32-bit (word) data transfer support

UART /SIO

- Two-channel SIO with DMA-based or interrupt-based operation; supports 5-bit, 6-bit, 7-bit, or 8-bit serial data transmit/receive
- Programmable baud rates
- Loop back mode for testing
- Infra-red (IR) Tx/Rx support

Parallel Port Interface Controller

- DMA-based or interrupt-based operation
- Support IEEE Standard 1284 communication modes (Compatibility mode, nibble mode, byte mode, and ECP mode)
- Hardware support for RLE data compression or decompression in ECP mode
- Automatic hardware hardshaking for forward or reverse data transfers in Compatibility and ECP modes.

Timer/Tone Generator/Watch Dog Timer

- Five programmable 16-bit timers, including one tone generator and one watch dog timer
- Watch dog timer output support for system reset
- Interval mode or toggle mode operation support for tone generator

Graphic Engine Unit (GEU)

- Hardware support for up to 256 Bit Block Transfer (Bitblt) operations
- X-Y coordinates support for source, pattern and destination data
- Scanline transfer support to reduce image storage requirements
- Source or pattern flipping
- Band fault check support

Image Function Block

- Two and three-times image expanding function support
- 90/270 degree rotation support for 16x16 data block
- Variable image scaling operation support
- Halftoning operation support for gray-level image conversion

Printer Interface Controller

- Cost -effective, high-performance DMA-based interface to the printer engine
- Dedicate DMA for fast data transfers between page memory and the printer engine
- Consecutive zero string (Blank data) output for banded bit maps (no memory access required)
- Queuing operation to facilitate smooth switching among data blocks of banded page memory
- Pixel chopping mode support for LBP toner save
- Dot shrinking mode support for fine-edged images printing
- Video data/boundary polarity defining support
- Two to four-times image expanding support

I/O Ports

- 16 programmable I/O ports
- Each port pin can be configured individually as input, output, or I/O for a dedicated signal

Interrupts

- 27 interrupt sources (2 external interrupts interrupt sources²⁷ included)
- Normal or fast interrupt modes (IRQ, FIQ)

Operating Voltage Range

- 4.75 to 5.25 volts

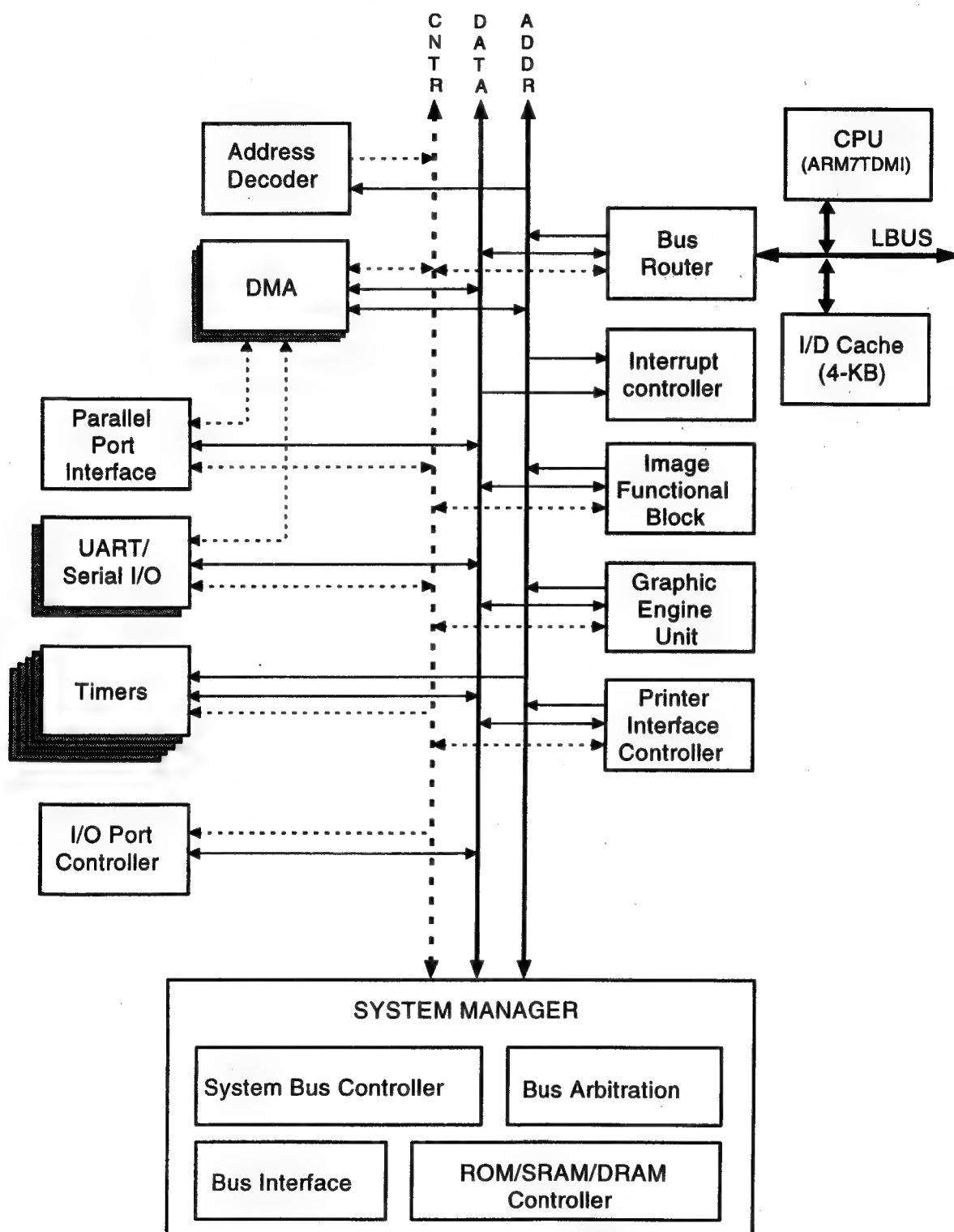
Operating Frequency

- up-to 33MHz

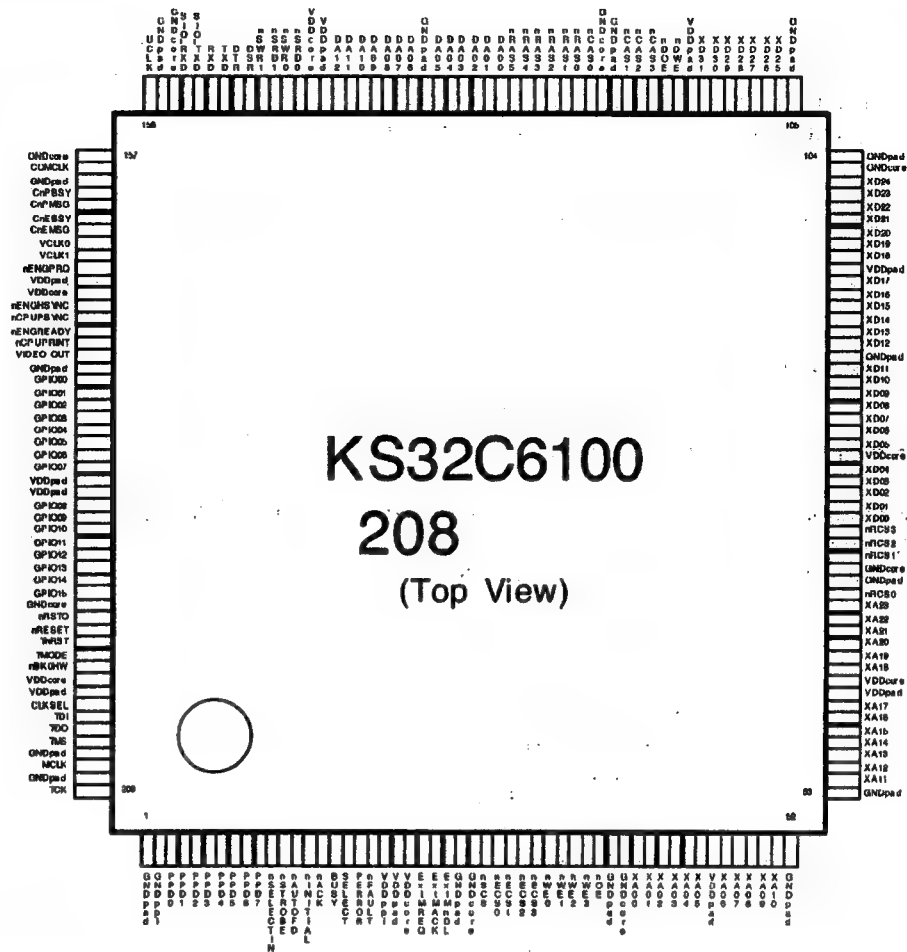
Package Type

- 208 -pin QFP

4.2.2.3 Block Diagram (KS32C6100 Block Diagram)



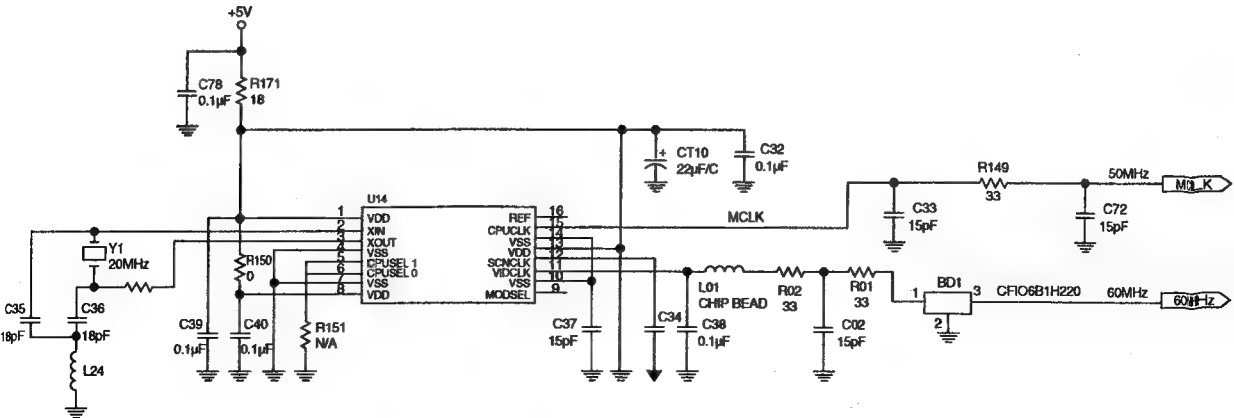
4.2.2.4 KS32C6100 PIN NAMES



4.2.3 CLOCK GENERATOR

A 20 MHz crystal is used to drive the U14 (clock generator). The clock generator supplies clock speeds of 40 MHz, 50 MHz and 60 MHz to drive the CPU and ASIC image chip.

CLOCK GENERATOR



4.2.4 DRAM

DRAM are used for the basic memory for a capacity of 2 MB.
The scanned data is stored when the data input at the parallel port is copied or scanned.

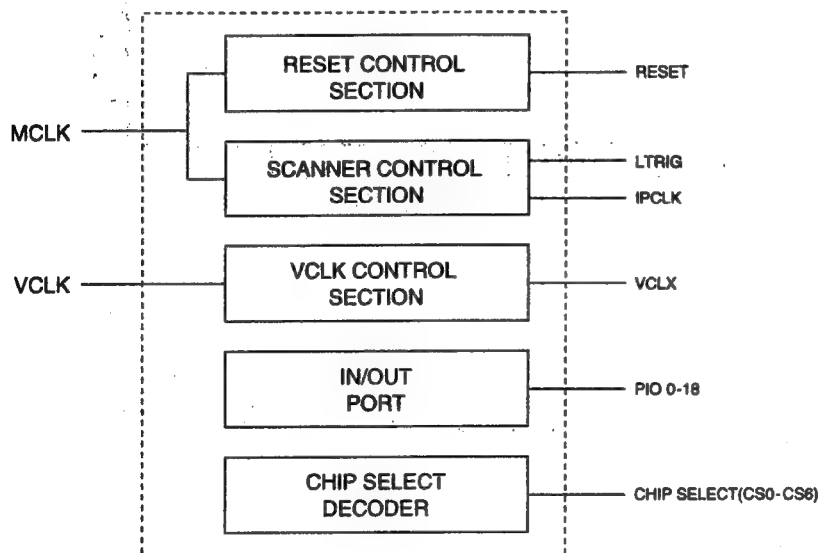
4.2.5 FLASH MEMORY

Flash memory are used, with built-in programs to drive the GDI drive and combined unit.

4.2.6 ASIC (MJM3000)

4.2.6.1 ASIC FUNCTION BLOCK DIAGRAM

Mainly for convenient scanner control, system control and printer control, MJM3000 puts these functions under direct IC control, and basic functions are divided into the reset control section, scanner control section, printer engine clock generation section and general I/O port section.



4.2.6.2 RESET CONTROL SECTION

Reset functions can be divided into POWER ON RESET, S/W RESET and WATCHDOG RESET, etc. These are processed by the reset control section.

4.2.6.3 SCANNER CONTROL

This generates the LTRIG signal, which is the line synchronization signal, and IPCLK, which is the clock for the image processing IC.

4.2.6.4 VCLK CONTROL

This is comprised of the frequency divider which creates the input master clock using the necessary VCLK, the duty control which controls the clock duty, and the section which controls the phase of VCLK.

4.2.6.5 GENERAL I/O PORTS

PIO0 - PIO18 can be used, with control of the input and output of each port possible.

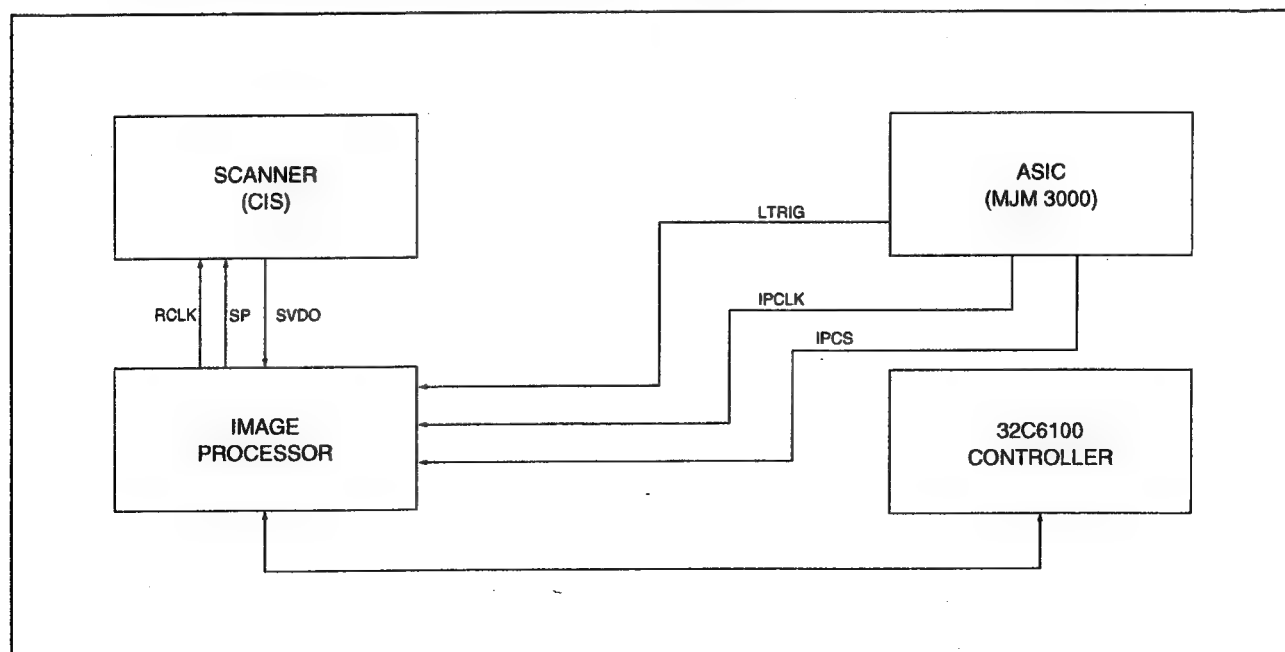
4.2.6.6 CHIP DECODER

This generates the chip selection signals for selecting the external IC to be used. A maximum of seven can be selected.

4.2.7 IMAGE PROCESSING SECTION

4.2.7.1 IMAGE PROCESSING BLOCK DIAGRAM

Image processing involves operating the scanner via ASIC under the control of the controller, the image processor performs image processing of the analog video signals generated by the scanner, and the images are read at the processor via DMA.



4.2.7.2 IMAGE PROCESSOR

The image processor is comprised of 1 device, the AK8414 for A/D conversion which converts analog signals into digital signals, and converts the digital data for each image mode.

- Main functions of AK8414:

- Black & white shading
- Correction
- Automatic gain control
- A/D conversion
- Alphabet/diagram discrimination function
- Edge emphasis function
- Enlargement/reduction function

4.2.7.3 CIS

This device uses the line synchronization signal and shift clock to convert the reflected light from the document into an electrical signal with a resolution of 200 DPI.

4.2.7.4 IMAGE PROCESSING

When the document is detected by the document detection sensor, first the black reference data and white reference data are read before the document is read, and this data is stored in the shading RAM for AK8414 to perform compensation when the actual document is read.

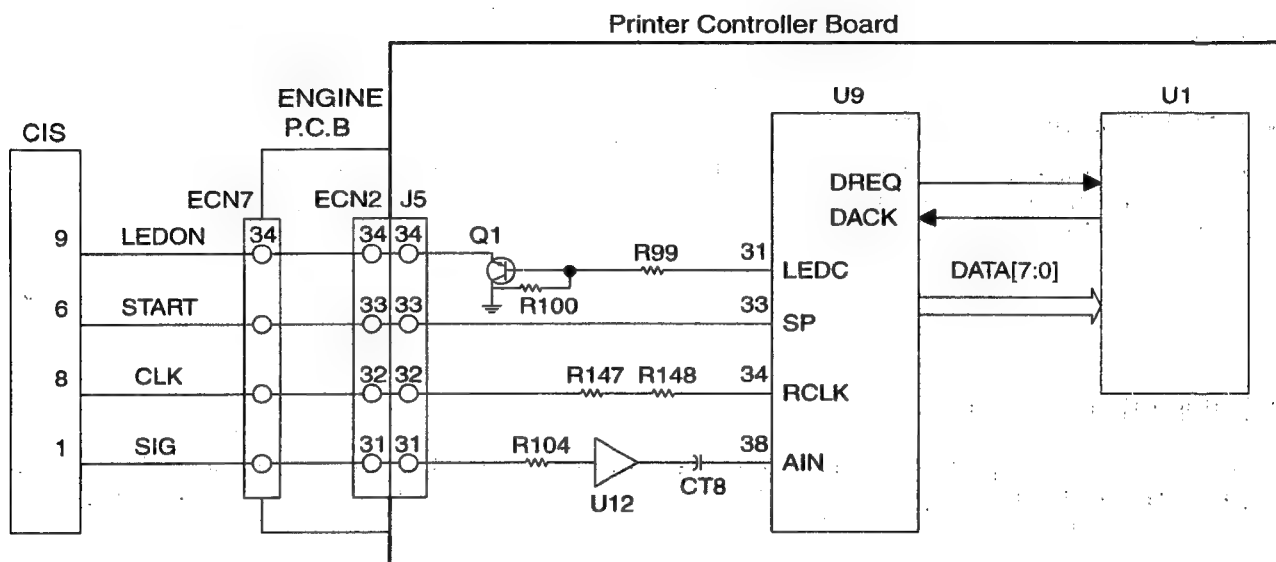
After the reference data has been read, the document is transferred to the scanner (CIS) reading position and then the actual document is read.

Document transfer is actually controlled by the engine controller, and scan line discrimination is performed by the start pulse (SP). In other words, after the SP is generated, sampling is performed by AK8414 which is generating analog signals in bit units at CIS by the shift clock, then after compensation of the originally set black/white values, the data is converted into 256 level digital signals (8 bit data).

4.2.7.5 SCANNING SECTION

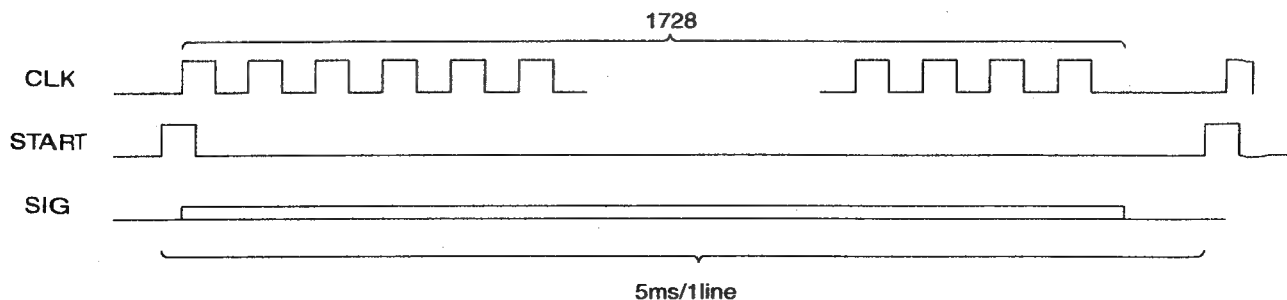
The scanning block of this device consists of a control circuit, a contact image sensor made up of a lens array, an LED array, and photoelectric conversion elements.

Circuit Diagram



When an original document is inserted and the start button pressed, pin 31 of U9 goes to a high level and the transistor Q1 turns on. This applies voltage to the LED array to light it. The contact image sensor is driven by each of SP-RCLK signals output from U9, and the original image illuminated by the LED array undergoes photoelectric conversion to output an analog image signal (SVDO). The analog image signal is input to pin 38 of U9 and converted into 8-bit data by the A/D converter inside U9. Then this signal undergoes digital processing in order to obtain a high-quality image.

Timing Chart



5. ENGINE CONTROLLER SECTION

The ENGINE CONTROLLER BOARD consists of the MICRO-COMPUTER (U5) and the circuits as shown below.

- ① Fixer temperature control
- ② Solenoid control
- ③ Motor control
- ④ FAN Motor control
- ⑤ LSU control

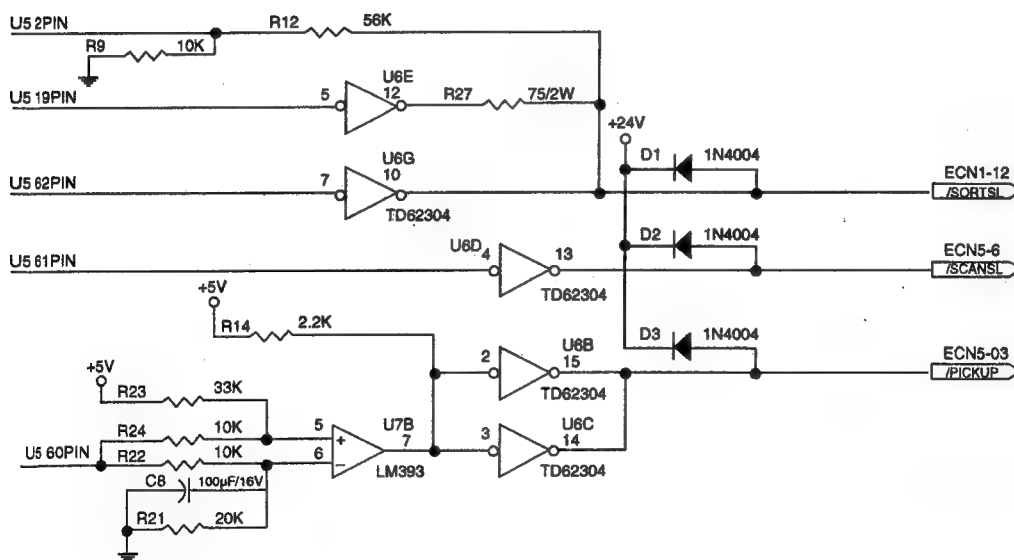
5.1 FIXER TEMPERATURE CONTROL CIRCUIT

The fixer temperature control circuit has a thermistor in contact with the heater roller inside the fixer to detect the surface temperature of the heater roller, and it turns the fixer ON/OFF. In details, see the POWER SUPPLY BOARD SECTION.

5.2 SOLENOID DRIVE CIRCUIT

The solenoid drive circuit controls the pick-up clutch, scanner section clutch and the dual sorting tray. The solenoid is designed to be driven by +24 V, driven by pins 60, 61 and 62 of the CPU. Diodes D1, D2 and D3 (1N4004) protect U6 from backward voltage when the solenoid is driven.

Solenoid Drive Circuit



5.3 STEPPING MOTOR DRIVE CIRCUIT

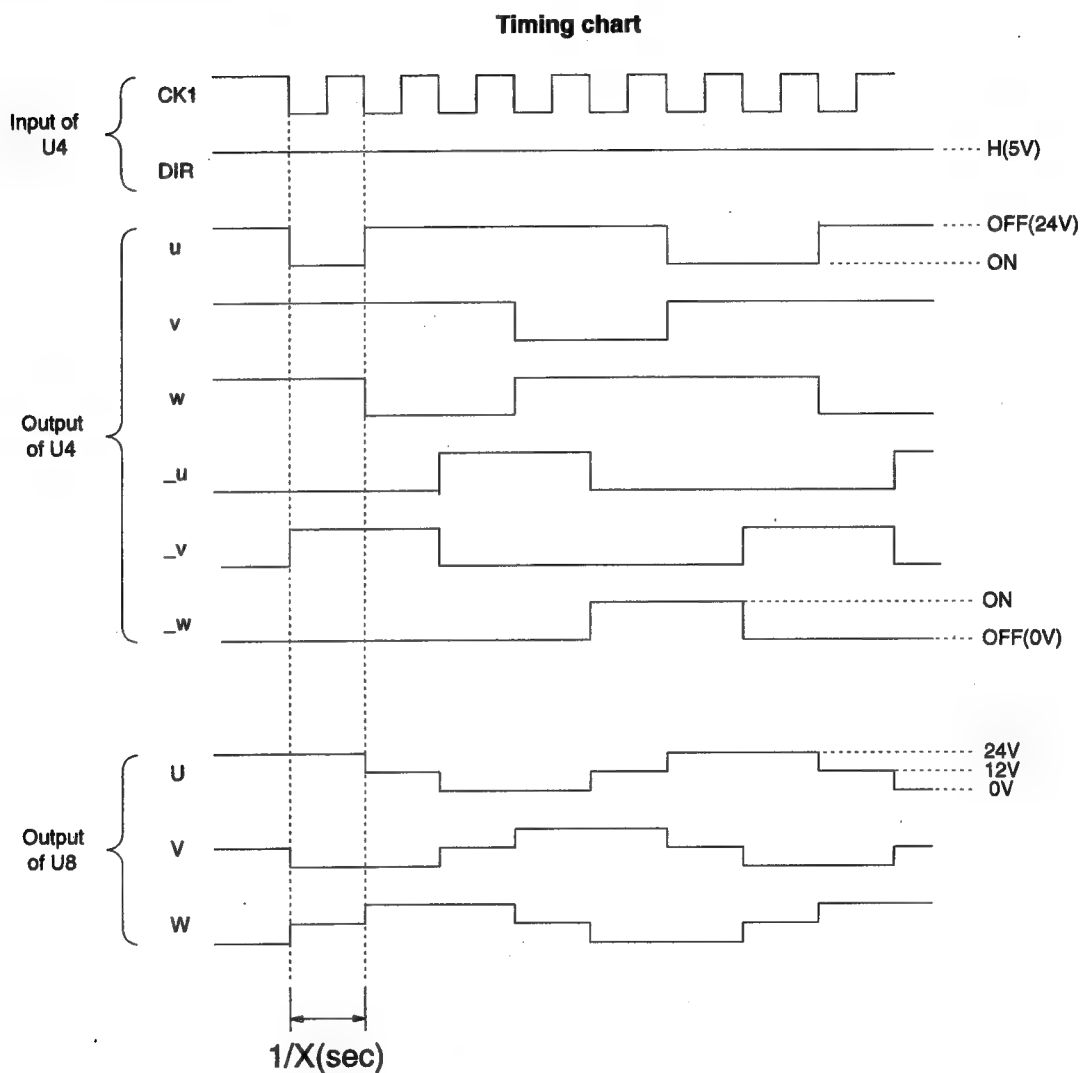
1) Function

This motor functions for main operations including FAX transmission, FAX reception, copy and PC printing.

2) Motor operation

Pulse emitting clock is output from U5-39 pin. Then, stepping pulse is output from U4-15, 16, 18, 19, 21, 22 pins and drives the motor coil.

The timing chart is below. (Worm-Up, Print Mode)



Function	Mode	Speed:X	CK2/DIR
Fax	Standard	1600pps	L
	Fine/Half tone	800pps	L
	Super Fine	400pps	L
Print/Worm-up	-	1091pps	H

5.4 FAN MOTOR DRIVE CIRCUIT

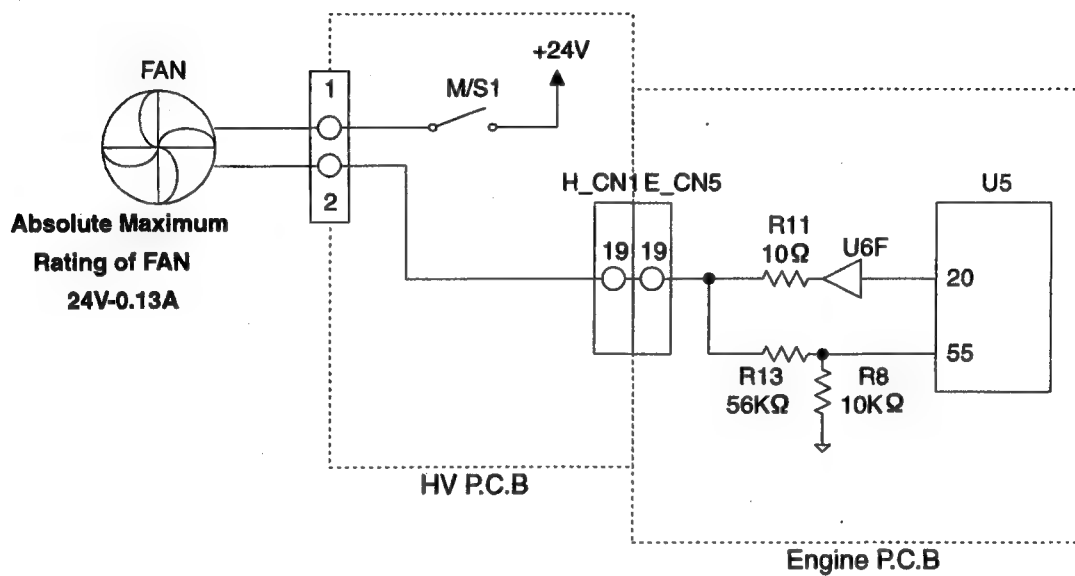
This FAN is used to radiate heat in the unit.

When the printer cover is open, M/S1 turns OFF and +24V is shut off so that the FAN does not work.

When the printer cover is closed and pin 55 of U5 becomes low level, the FAN rotates.

The signal level at U5-pin 55 becomes low, the FAN is activated.

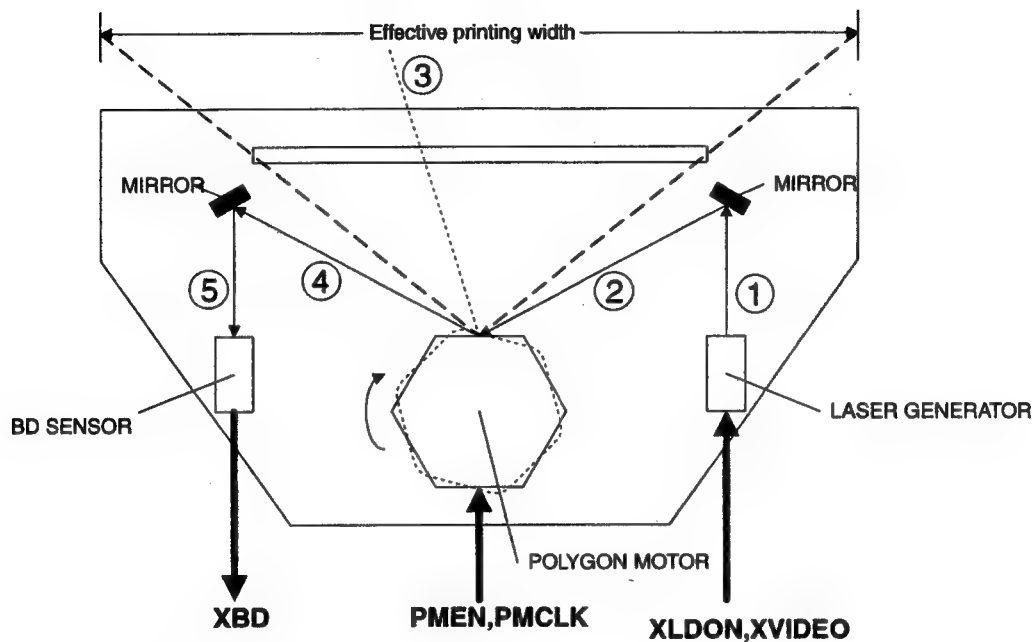
In this case, the signal level at pin 55 of U5 becomes high and the rotation of the FAN is detected.



Mode	U5-20pin	U5-55pin
FAN open check(OK)	high level	3.5V
FAN open check(NG)	high level	0V
Normal	low level	about 0.2V

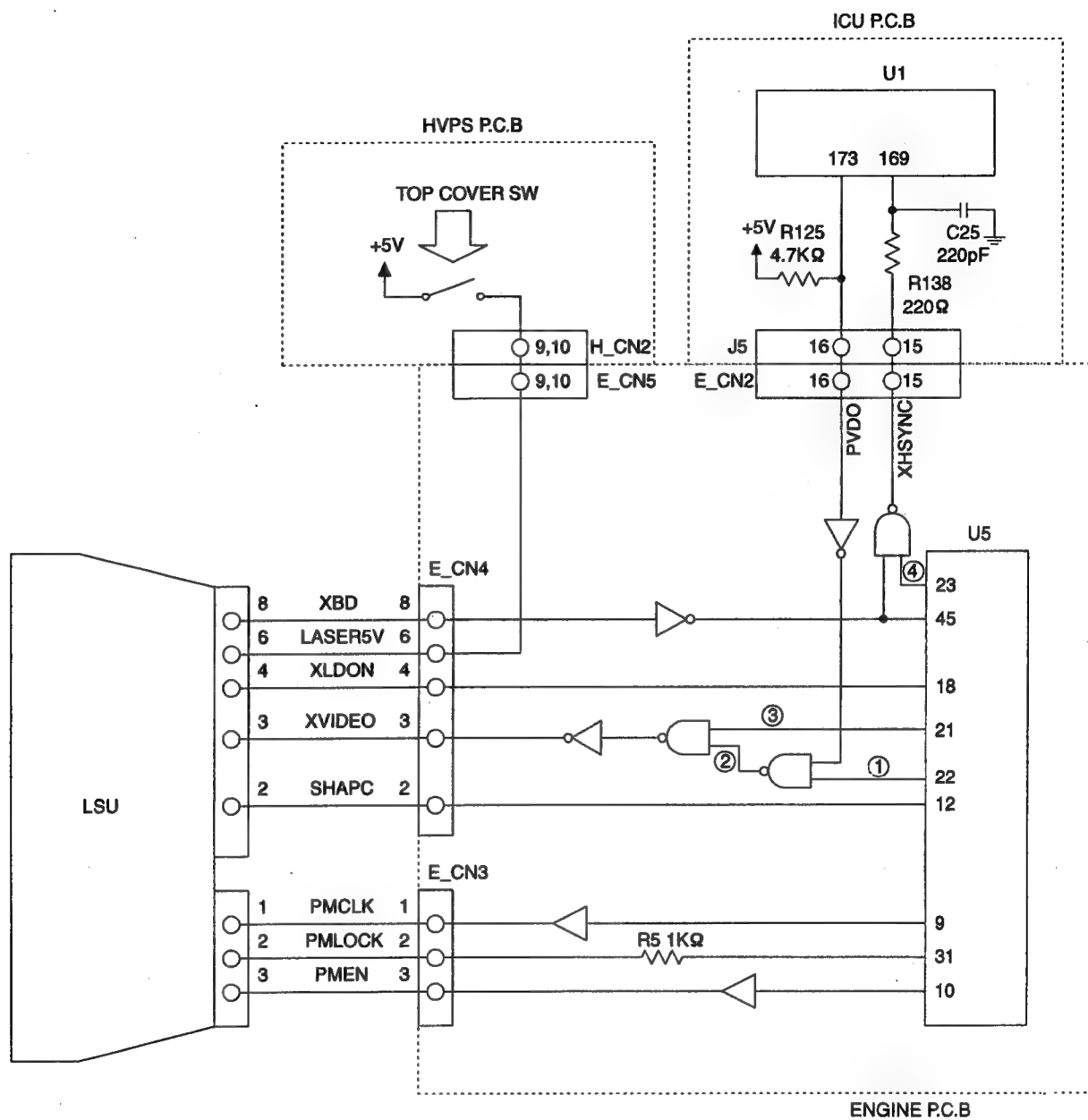
5.5 LSU (Laser Scam Unit) CONTROL CIRCUIT

LSU forms the image on the drum by rotating polygon motor and reflecting the laser beam against polygon mirror. Structure inside is shown below.



- ① Laser output
- ② Laser reflected by mirror
- ③ Laser reflecting on the drum
- ④ Laser towards the effective printing outside range
- ⑤ Laser reflected by mirror and reflecting onto the sensor

Circuit Diagram



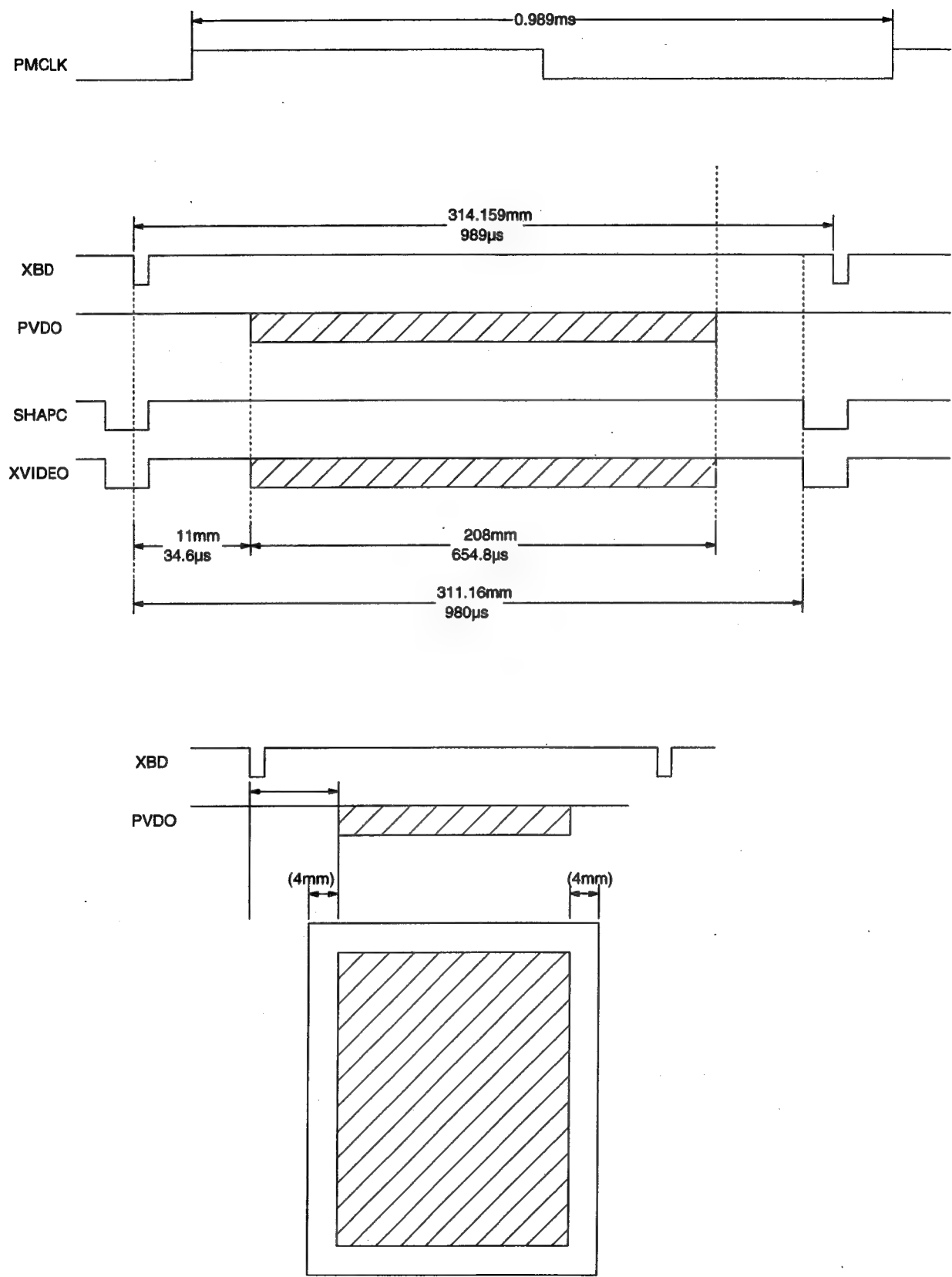
Each signal level during printing

If you have any trouble, check each signal and make sure output/input are as follows.

- ①: 'H'
- ②: =PVDO
- ③: 'H'
- ④: 'H'
- PMEN: 'L'
- PMLOCK: 'L'
- LASER5V: 'H'
- LDON: 'L'

PMCLK, XBD, XVIDEO, SHAPC: Refer to timing chart

Timing Chart (PC print)



6. SENSORS AND SWITCHES SECTION

All of the sensor and switches are shown below.

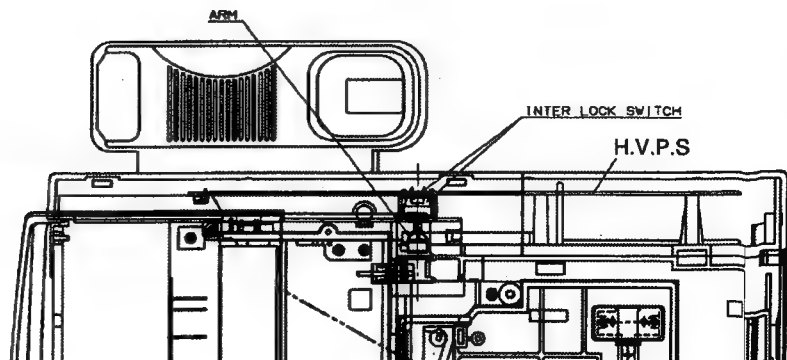
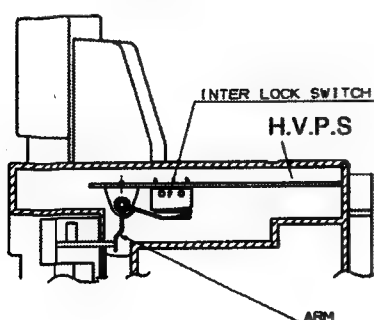
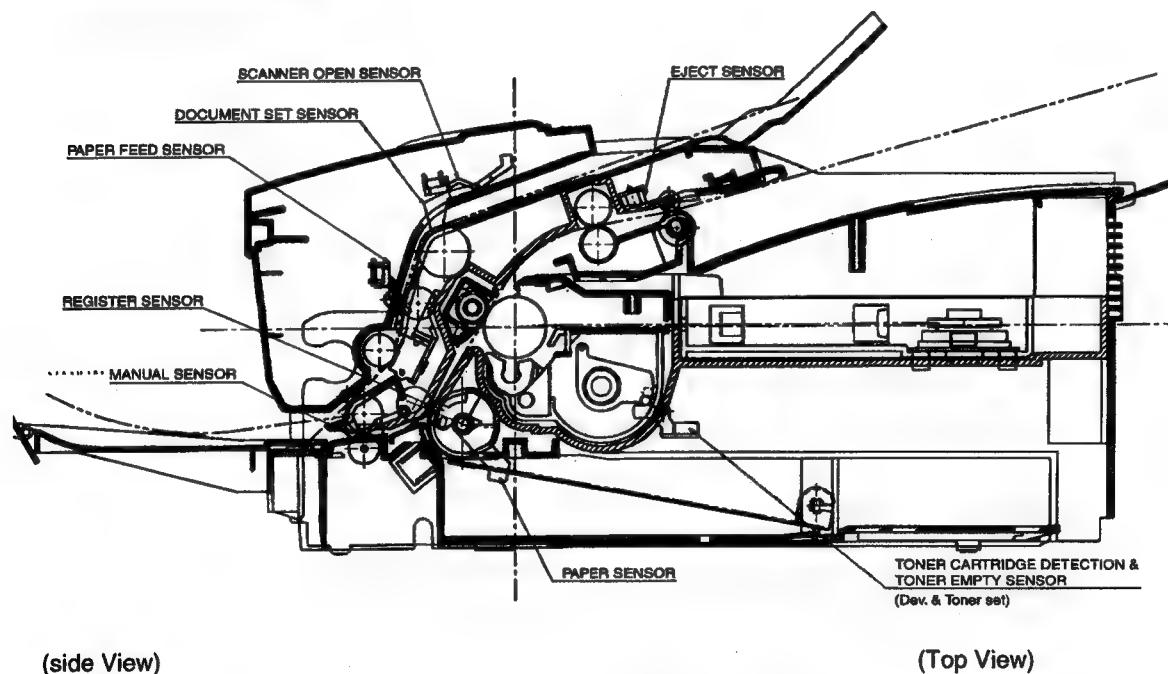
Sensor Circuit Location	Sensor	Sensor or Switch Name	Message Error	Page
Operation Panel	PI301	Document Set	[CHECK DOCUMENT]	230
Engin Controller PCB	PI	Dev & Toner Set	[CHECK TONER] [TONER LOW]	235
High Voltage PCB	SW	Printer Cover Open	[TOP COVER OPEN]	232
Sensor PCB	SW	Laser Power	_____	234
	SW	OPC Set	[CHANGE DRUM] [CHECK DRUM]	
Sensor PCB	PI	Register	[FAILED PICKUP]	233
Sensor PCB	PI	Paper	[OUT OF PAPER]	232
Sensor PCB	SW	Manual	_____	233
Sensor PCB	SW	Exit	[PAPER JAMMED]	233
Sensor PCB	SW	Paper Feed	[REMOVE DOCUMENT]	230
Sensor PCB	SW	Scanner Cover Open	[PANEL OPEN]	231
Sensor PCB	SW401	Hook Switch	_____	231

Note:

See TEST FUNCTIONS - SENSOR CHECK SECTION for the sensor test.

(#815 of Service Mode test. Refer to TEST FUNCTIONS.) (see page 131)

SENSORS AND SWITCHES LOCATION

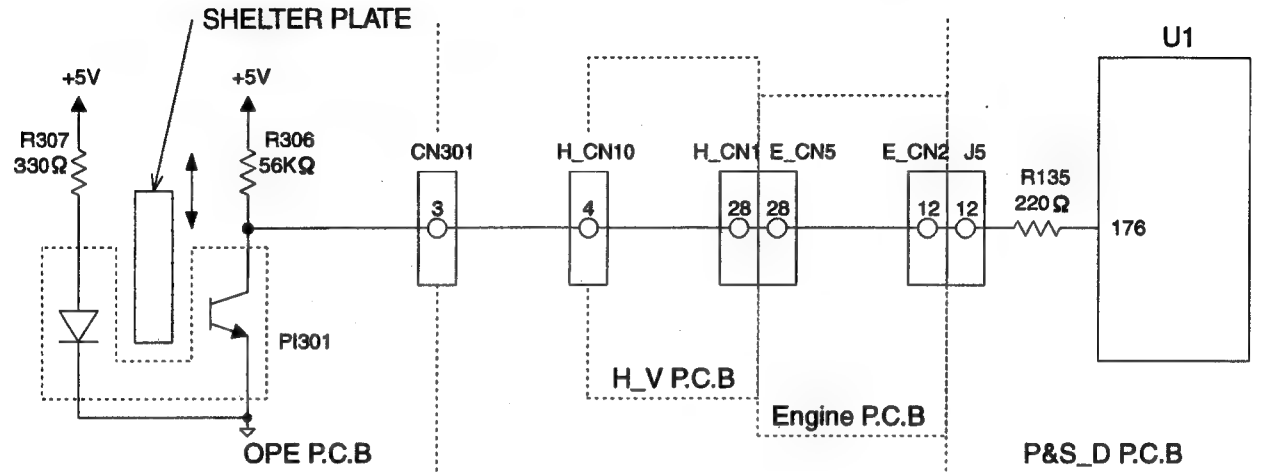


6.1. DOCUMENT SENSOR (PI301)

The Sensor detects whether or not a document is set in place.

When a document is detected, the shelter plate is lifted so that the sensor light can pass through, the phototransistor turns ON, and the input signal of U1-176pin (Printer & Scanner Driver P.C.B) becomes a low level.

When there is no document, the shelter plate shuts off / cut off the sensor light, the phototransistor turns OFF, and the input signal of U1-176pin (Printer & Scanner Driver P.C.B) becomes a high level.



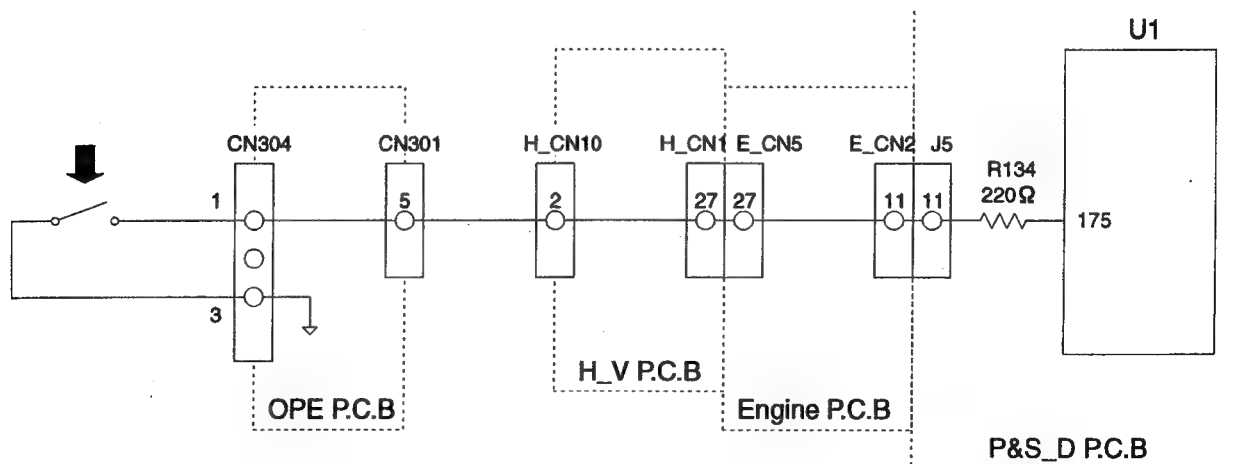
	Phototransistor	Signal(U1-176pin)
No Document	OFF	High level
Document Set	ON	Low level

6.2. PAPER FEED SENSOR

The Sensor detects the leading edge of the document.

When a document is brought to the read position, the switch turns ON, and the input signal of U1-175pin (Printer & Scanner Driver P.C.B) becomes a low level.

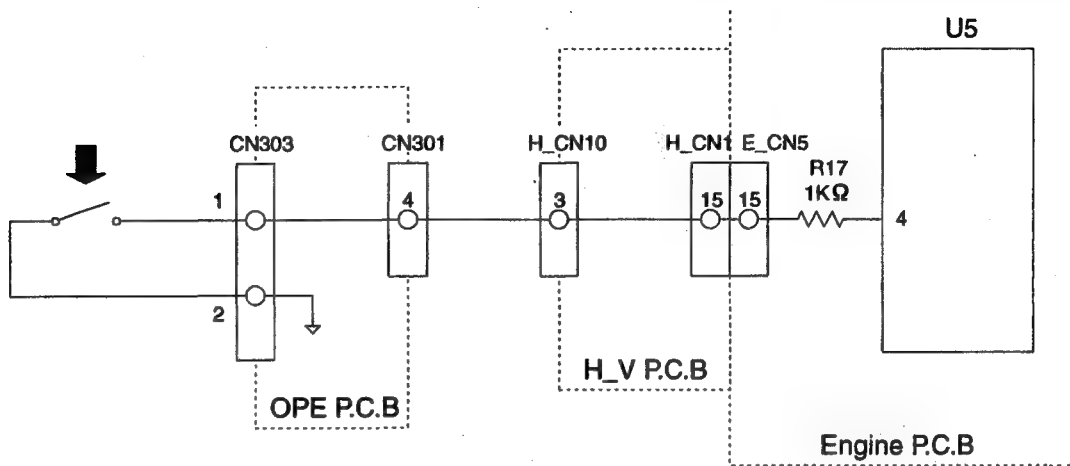
When there is no document at the read position, the switch turns OFF, and the input signal of U1-175pin (Printer & Scanner Driver P.C.B) becomes a high level.



	Switch	Signal(U1-175pin)
Non Read Position	OFF	High level
Read Positon	ON	Low level

6.3. SCANNER COVER OPEN SENSOR (C_SW)

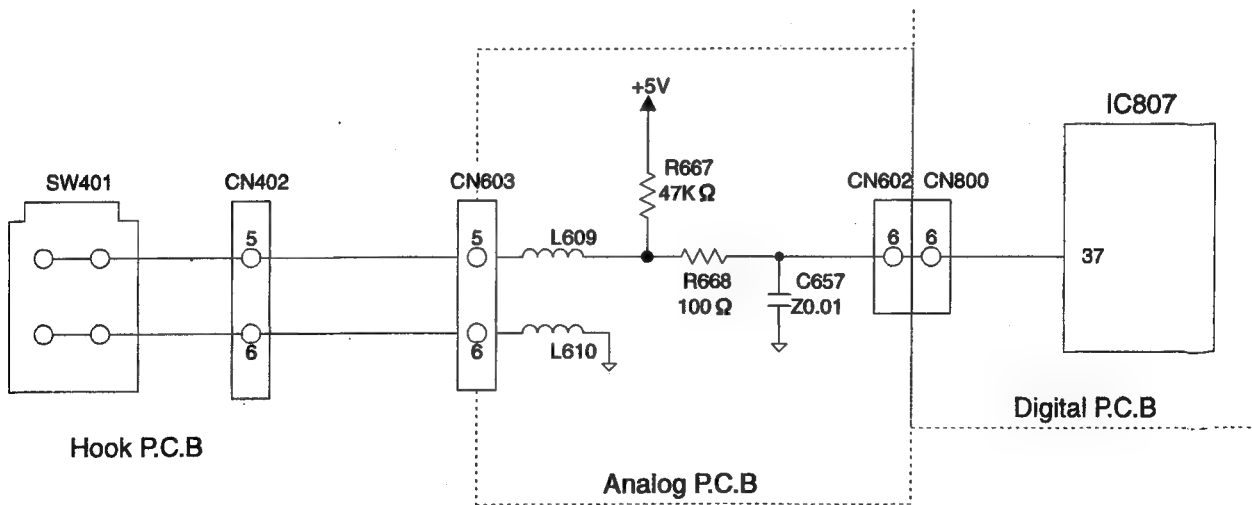
The Switch detects whether the printer cover is open or closed.
When the printer cover is closed, the switch turns ON, and the input signal of U5-4pin (Engin P.C.B) becomes a low level.
When the printer cover is open, the switch turns OFF, and the input signal of U5-4pin (Engin P.C.B) becomes a high level.



	Switch	Signal(U5-4pin)
Open	OFF	High level
Close	ON	Low level

6.4. HOOK SWITCH (SW401)

When the handset is lifted, the switch becomes ON, and the signal level at pin 37 of IC807 goes down.
When the handset is returned, the switch is becomes OFF, and the signal level at pin 37 of IC807 becomes high.

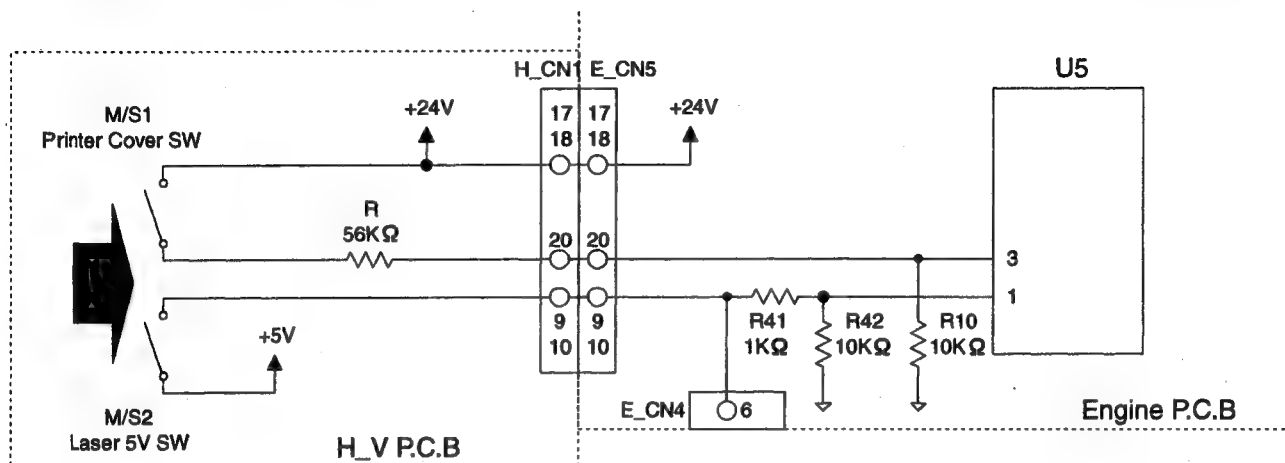


6.5. PRINTER COVER OPEN SWITCH / LASER 5V SWITCH (M/S1,M/S2)

The Switches detect whether the printer cover is open or closed.

When the printer cover is closed, the switches turn OFF, and the input signal of U5-1, 3pin (EngineP.C.B) becomes a high level.

When the printer cover is open, the switches turn ON, and the input signal of U5-1, 3pin (EngineP.C.B) becomes a low level.



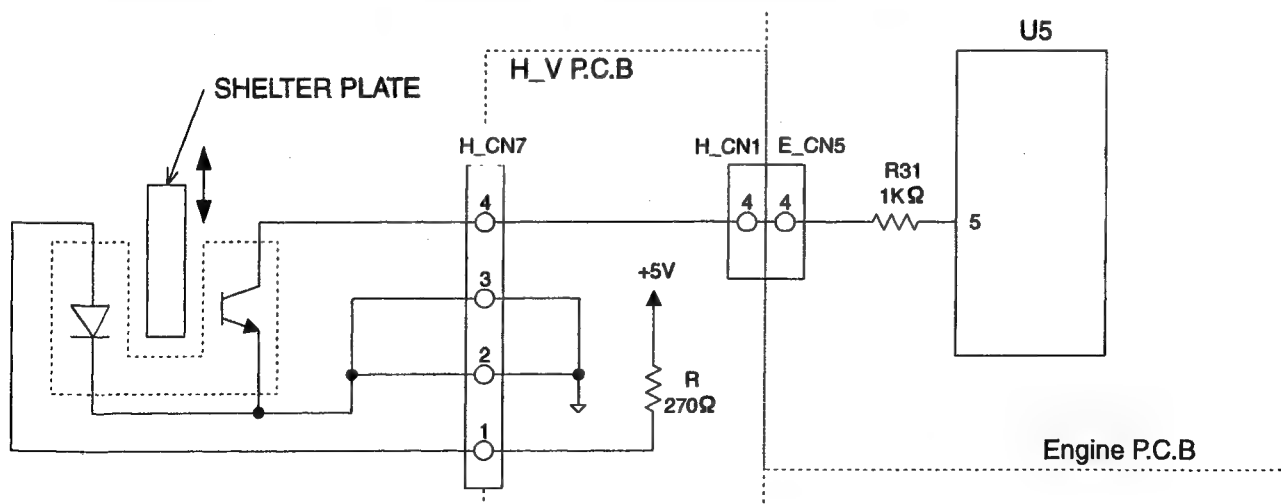
	Switch	Signal(U5-3pin)
Open	OFF	Low level
Close	ON	High level

6.6. PAPER SENSOR (P-SEN)

The Sensor detects whether or not the cassette and the recording paper are properly installed.

When the cassette is set the recording paper is detected, the shelter plate is lifted so that the sensor light can pass through. Then, the phototransistor turns ON, and the input signal of U5-5pin (Engine P.C.B) becomes a low level.

When there is no cassette nor recording paper, the shelter plate shuts off the sensor light, the phototransistor turns OFF, and the input signal of U5-5pin (Engine P.C.B) becomes a high level.



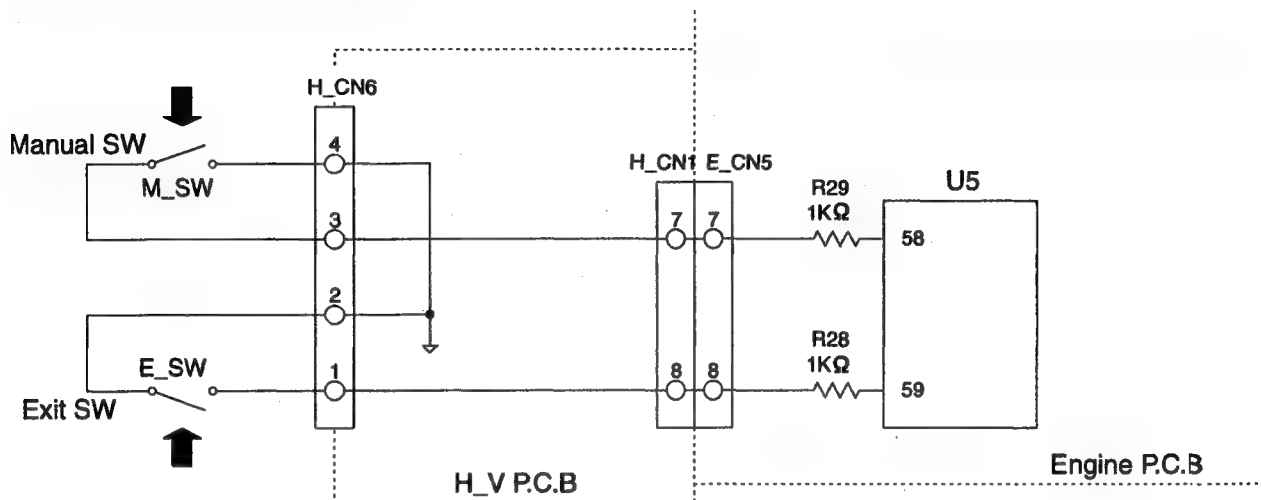
	Phototransistor	Signal(U5-5pin)
No Cassette	OFF	High level
No Recording Paper	OFF	High level
Recording Paper Set	ON	Low level

6.7. MANUAL SWITCH / EXIT SWITCH(M_SW,E_SW)

The Switches detect whether the recording paper is installed or not.

When there is no recording paper, the switches turn OFF, and the input signal of U5-58, 59pin (EngineP.C.B) becomes a high level.

When there is the recording paper is properly installed, the switches turn ON, and the input signal of U5-58, 59pin (EngineP.C.B) becomes a low level.



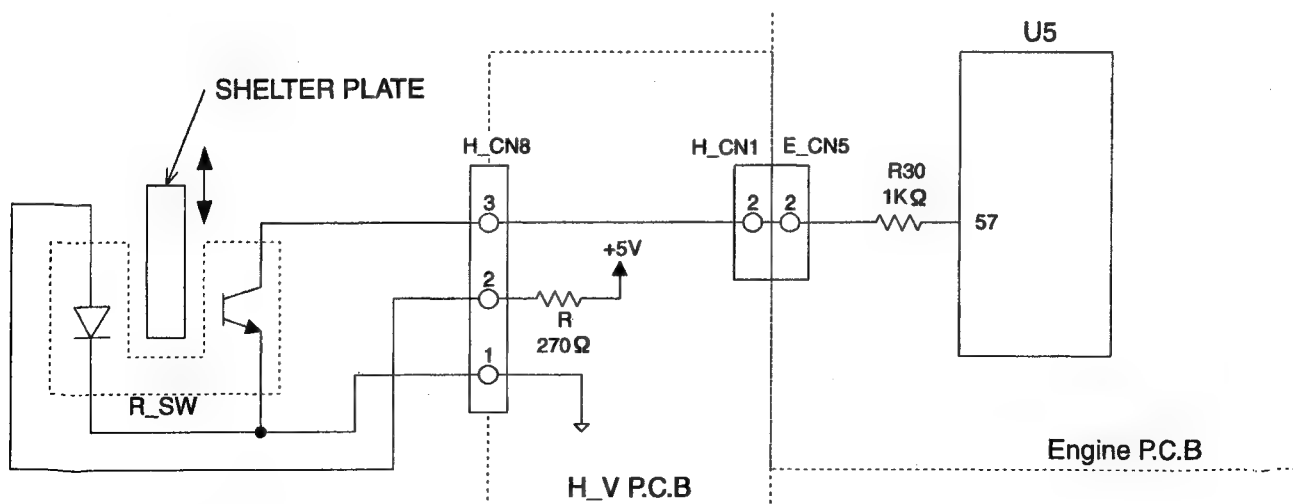
	Switch	Signal(U5-58,59pin)
No Paper	OFF	High level
Paper Exist	ON	Low level

6.8. RESISTER SENSOR (R_SEN)

The Sensor detects whether or not the recording paper is set in the paper cassette properly.

When the recording paper is detected, the shelter plate is lifted so that the sensor light can pass through. Then, the phototransistor turns ON, and the input signal of U5-57pin (Engine P.C.B) becomes a low level.

When there is no recording paper, the shelter plate shuts off the sensor light, the phototransistor turns OFF, and the input signal of U5-57pin (Engine P.C.B) becomes a high level.



	Phototransistor	Signal(U5-57pin)
No Recording Paper	OFF	High level
Recording Paper Regist	ON	Low level

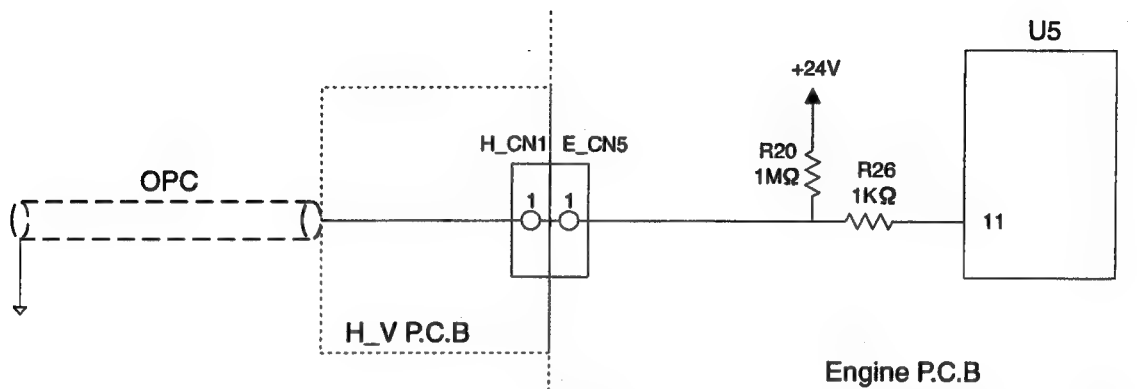
6.9. OPC SENSOR

The Switch detects whether the OPC unit is set or not.

When there is the OPC unit, the input signal of U5-11pin (Engine P.C.B) becomes a low level.

When there is no OPC unit, the input signal of U5-11pin (Engine P.C.B) becomes a high level.

Circuit Diagram

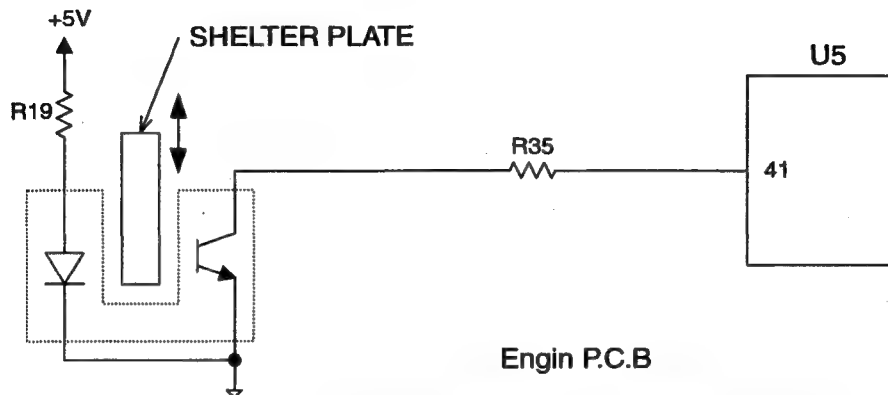


	Signal(U5-11pin)
OPC Set	Low level
	High level

6.10. Dev. & Toner Sensor

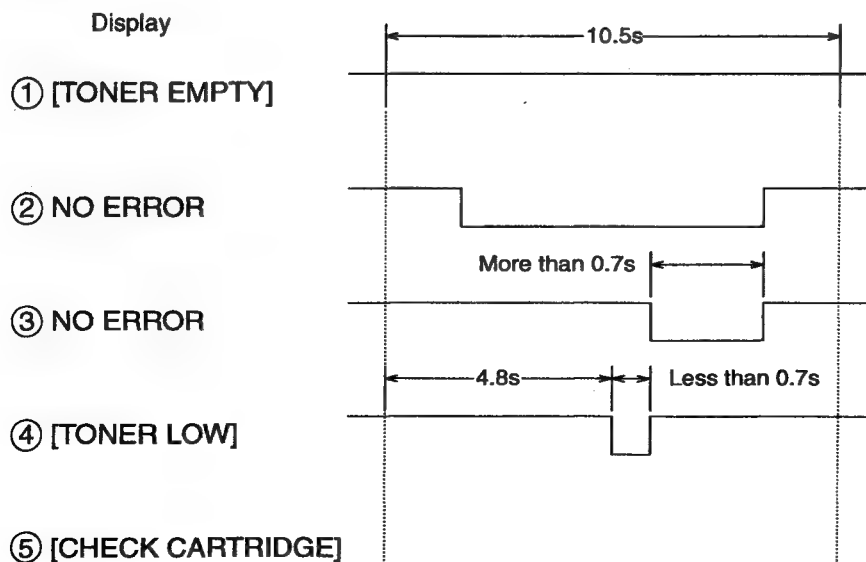
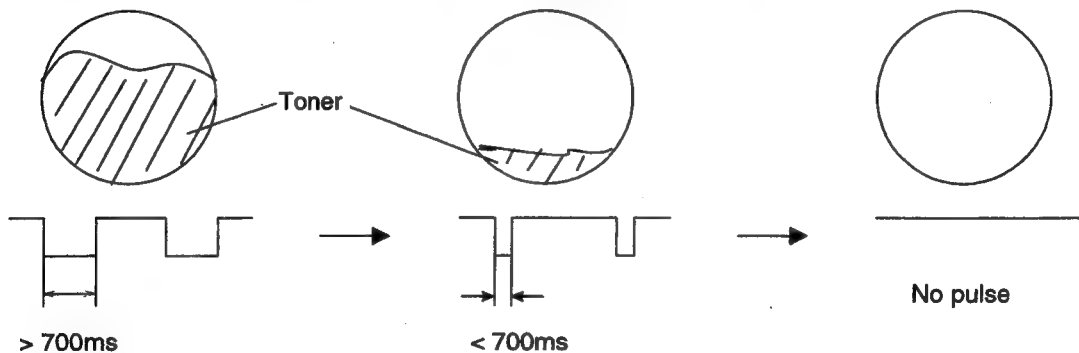
The Sensor detects whether or not the Developer unit and the toner are set in place present. When there is not Development unit, the shelter plate is lifted so that the sensor light can pass through, the phototransistor turns ON, and the input signal of U5-41pin (Engin P.C.B) becomes a low level over 10.5s. When the Developer unit is set, the shelter plate move with rotation of development roller, so the phototransistor turns ON/OFF. If the time of U5-41pin's high level is over 700ms, there is enough toner in Developer unit. If it is not over 700ms, toner is near empty.

Circuit Diagram



	Phototransistor	Signal(U5-41pin)
No DEV Unit	ON time > 10.5s	Low level fix
Near Empty Toner	ON time < 700ms	low level < 700ms
Toner Set	ON time > 700ms	low level > 700ms

Timing chart



7 HVPS (High Voltage Power Supply) SECTION

7.1 HVPS SPECIFICATIONS

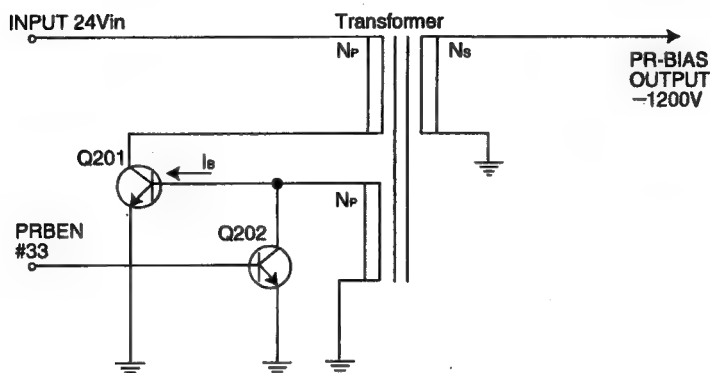
NO	Output Voltage	Item	Specification	Notes
1	Electrostatic Charge PR BIAS	Rated output voltage	-1200V \pm 5% at 120M $\frac{1}{2}$	
		Variable output range	-1000~1400V	
		Output current	-10 μ AMax	
		Output format	Constant voltage	
2	Developing DE BIAS	Rated output voltage	-350V \pm 5% at 60M $\frac{1}{2}$	
		Variable output range	-200~-400V	
		Output current	-5 μ AMax	
		Output format	Constant voltage	
3	Supply Roller CH BIAS	Rated output voltage	-600V \pm 5% at 60M $\frac{1}{2}$	
		Variable output range	-500~-800V	
		Output current	-10 μ AMax	
		Output format	Constant voltage	
4	Transfer TR BIAS	Rated output current	+11 μ A \pm 5% at 350M $\frac{1}{2}$	Output voltage varies with the surrounding environment (temperature, humidity).
		Variable output range	+7~12 μ A	
		Output voltage	+2000V Max	
		Output type	Constant current & constant voltage	
	RTR BIAS	Rated output voltage	-850V \pm 5% at 120M $\frac{1}{2}$	
		Variable output range	-400~-800V	
		Output current	-10 μ AMax	
		Output type	Constant voltage	

TR BIAS is output from one of the output terminals after the TRSEL signal selects TR BIAS and RTR BIAS.

7.2 PR-BIAS (PRIMARY BIAS) UNIT

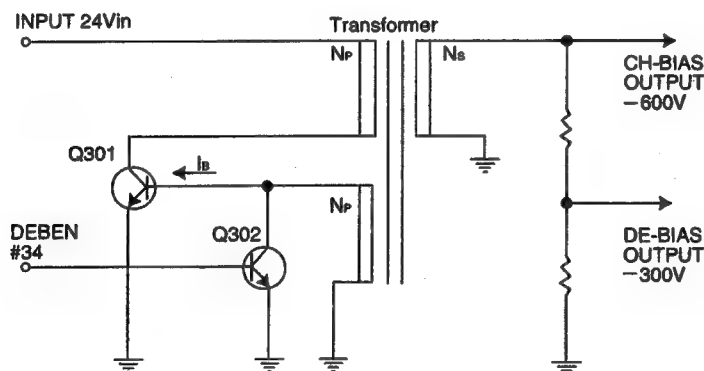
After the surface of the photosensitive drum (OPC DRUM) is cleaned, the electrostatic charge is used to adjust the electrical load on the drum surface to a uniform condition of -600 V to -650 V before the image is received. If terminal PRBEN is initially Active High, base current I_B at Q201 is detected and the electrostatic voltage is output.

Circuit Diagram



7.3 CH-BIAS (Charge-Bias) /DE-BIAS (Developing-Bias)

Circuit Diagram



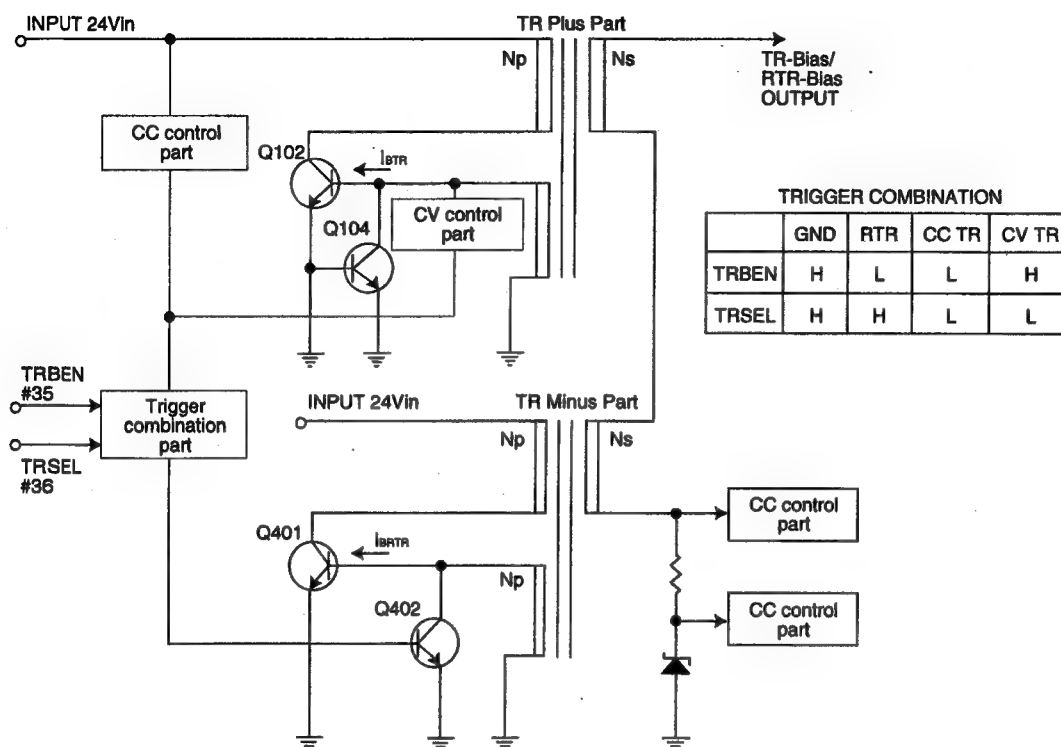
Toner is transferred selectively to only the electrostatic latent image section of the drum surface by the combined effect of the photosensitive drum (OPC DRUM) surface and the constant electricity, and the developing outputs DE-BIAS and CH-BIAS are used to visualize the electrostatic latent image formed at the lighting stage.

If terminal PRBEN is initially Active High, base current I_B at Q301 is bypassed by Q302, so the developing output voltage becomes OFF; if terminal PRBEN is detected to be Active Low, I_B is detected at Q301 and developing voltage is output.

At this time, the charging voltage (charge) of the toner output by the developer is a standard value of -600 V, and the developing drum charge (developing charge) has a selected shared voltage value (- 350 V) between the charge output and GND.

7.4 TR-BIAS (Transfer-Bias) RTR-BIAS (Reverse Transfer-Bias) UNIT

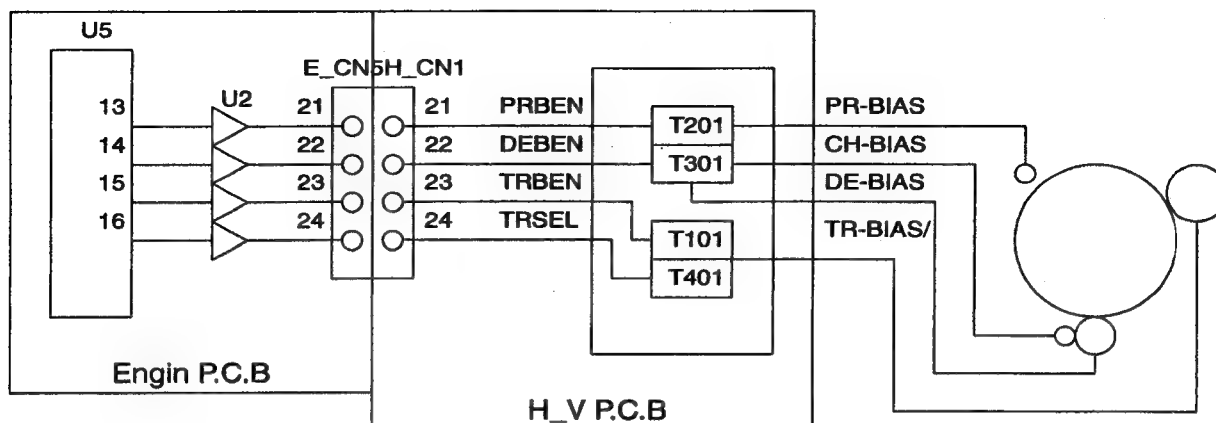
Circuit Diagram



The transfer voltage is comprised of the (+) output section (C/C TR-Bias: Constant Current Transfer-Bias, and C/V TR-Bias: Constant Voltage Transfer-Bias) and the (-) output section (RTR-Bias: Reverse Transfer-Bias). However, the (-) output section is used for cleaning the toner on the transfer roller, and the (+) output section is used to apply to the paper the toner image visualized on the drum surface. If terminals TRBEN and TRSEL are initially Active High, base current IBTR and IBRTR from Q401 is bypassed at GND, so all output becomes OFF. If terminal TRBEN is Low and terminal TRSEL is High, only base current IBTR at Q103 is bypassed, and reverse transfer voltage of -600 V is output. If terminal TRBEN and terminal TRSEL are Active Low, only base current IBRTR at Q401 is bypassed, and the constant current transfer (C/C TR-Bias) voltage is output. If terminal TRBEN is Active High and terminal TRSEL is Active Low, the constant voltage transfer (C/V TR-Bias) voltage is output.

H.V.P.S (High Voltage Power Supply)

Circuit Diagram



PR-BIAS: Constant voltage; about -1180V, power on in synchronism with motor .

OH-BIAS: Constant voltage; about -600V, power on from charged section one sec. later, afterwards synchronize with the charged section.

DE-BIAS: Constant voltage; about -350V, generated by resistance partial pressure from supplied voltage.

TR-BIAS: Two kinds of transformer for + and -

Cleaning at - only, constant voltage transcription at + only.

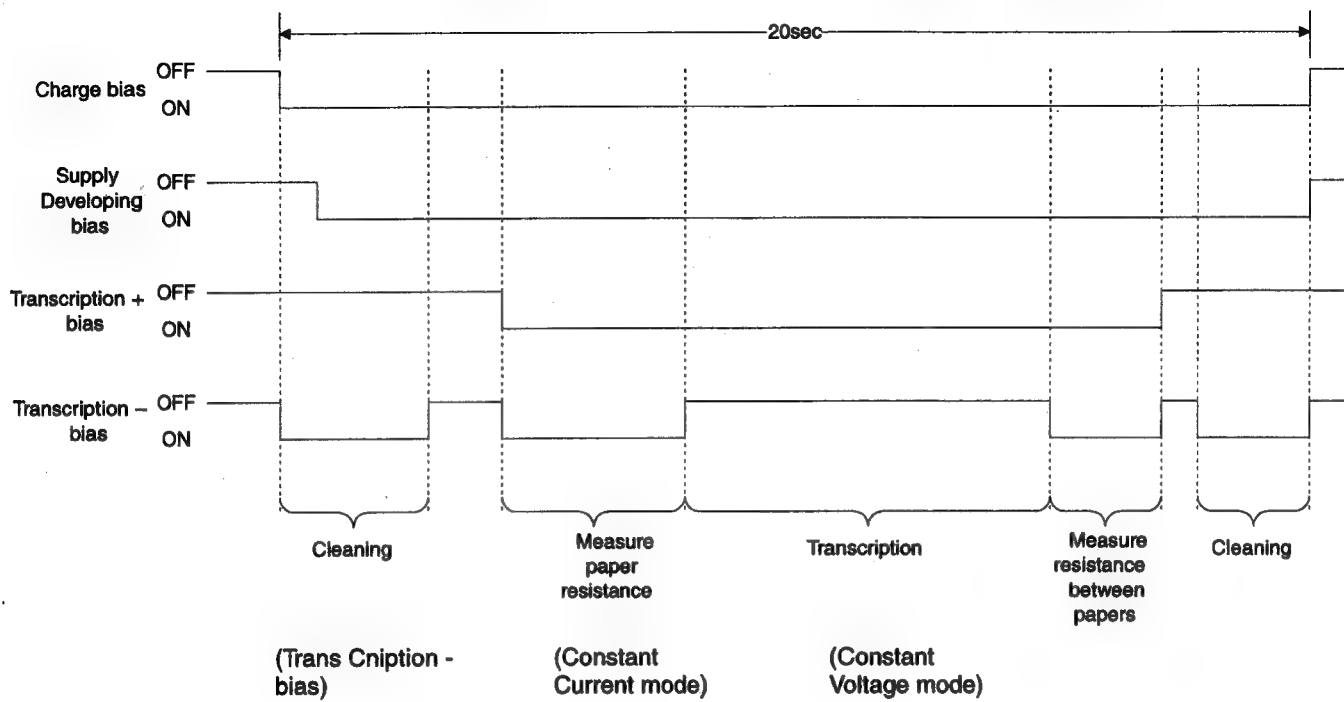
① Constant voltage; about -870V, Put toner attached to transcription roller back to OPC drum

② Constant current; about +11 μ A, used to determine the transcription voltage by paper resistance when the document is inserted in the transcription section.

③ + Constant voltage; When paper is inserted in the transcription section, voltage goes up by paper resistance. At this state, hold the voltage and use it for transcription. Except, for manual printing, transcription is performed at constant current mode.

		TRSEL signal	
		Low level	High level
TRBEN signal	Low level	11 μ A Constant Current Mode	-870V Constant Voltage Mode
	High level	+600~+2.3KV Constant Voltage Mode	OFF

Timing Chart (When Printing one sheet of paper)



8. OPERATION BOARD SECTION

The unit consists of a LCD (Liquid crystal display), KEYS and LEDs (light-emitting diodes). They are controlled by the Gate Array (IC301) and ASIC (IC807: on the DIGITAL BOARD). (Fig.-a)

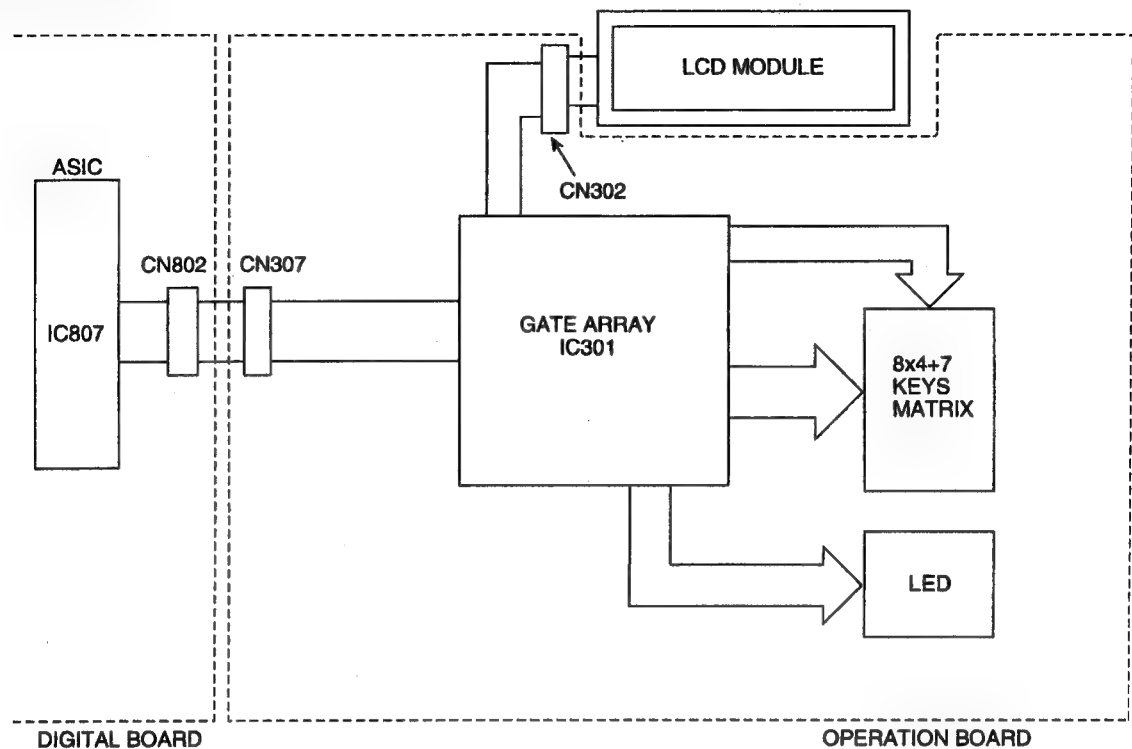


Fig-a

Key Matrix

	KIN0	KIN1	KIN2	KIN3	KIN4	KIN5	KIN6	KIN7
KSL0	SW301 ONE9.20	SW305 ONE5.16	SW309 ONE1.12	SW313 QUICK SCAN	SW317 *	SW321 7	SW325 4	SW329 1
KSL1	SW302 ONE10.21	SW306 ONE6.17	SW310 ONE2.13	SW314 STOP	SW318 SP-PHONE	SW322 MUTE	SW326 REDIAL/PAUSE	SW330 FLASH
KSL2	SW303 ONE11.22	SW307 ONE7.18	SW311 ONE3.14	SW315 START/SET/COPY	SW319 #	SW323 9	SW327 6	SW331 3
KSL3	SW304 LOWER	SW308 ONE8.19	SW312 ONE4.15	SW316 COLLATE	SW320 0	SW324 8	SW328 5	SW332 2

	XLD15	XLD14	XLD13	XLD12
LED3	SW333 VOL-UP	SW336 VOL-DOWN	SW339 FAX-ON	SW342 IQ-FAX
LED2	SW334 HELP	SW337 MENU		SW343 RESOLUTION

LED

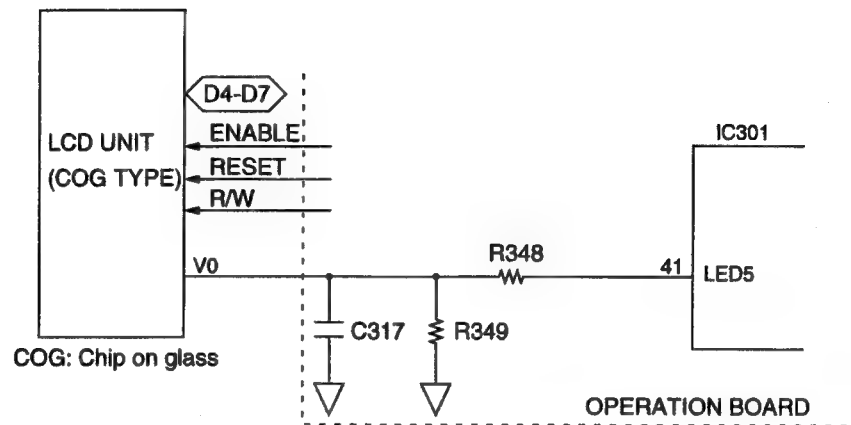
	LED10	LED6
	LED301 SP-PHONE	LED302 FAX ON

9. LCD SECTION

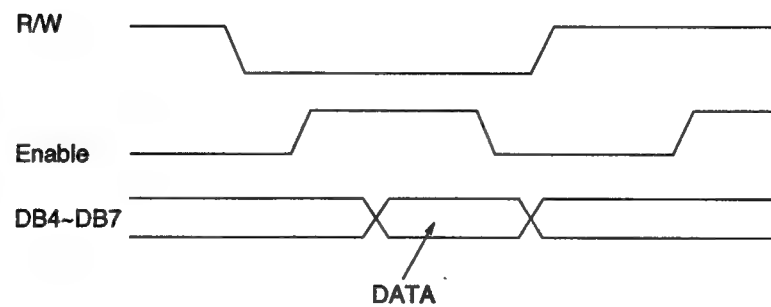
The Gate Array (IC301) only needs to write the ASCII code from the data bus (D4~D7). V0 is supplied for the crystal drive. R323 and R322 are density control resistors.

Consequently, in this unit, the timing (positive clock) is generated by the LCD interface circuitry in the gate array (IC301).

Circuit Diagram

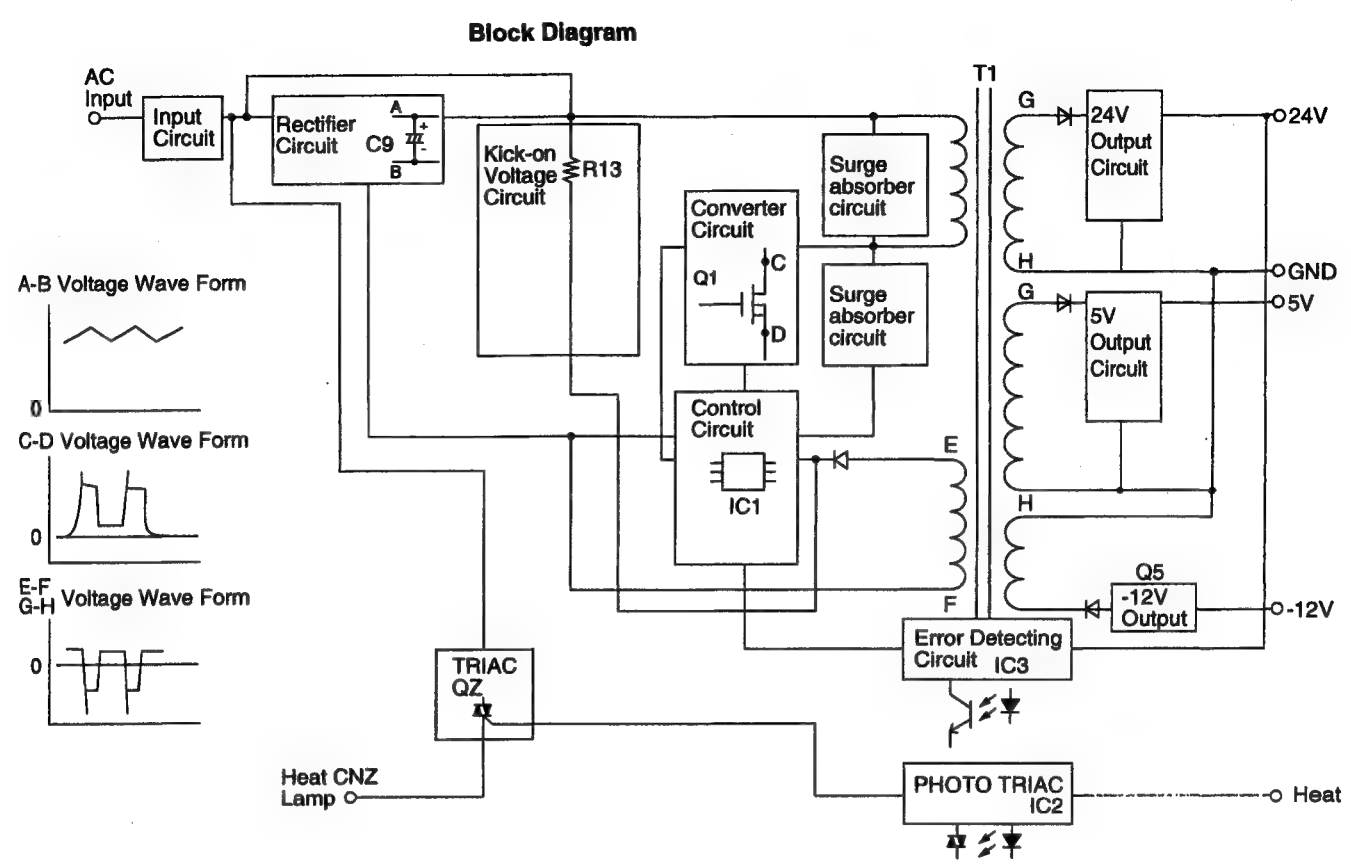


Timing Chart



Density	Norma	Dark
LED5 (IC301-41pin)	H	L

10. POWER SUPPLY SECTION



- [Input Circuit]

The input current goes into the input rectifier circuit through the filter circuit. The filter circuit decreases the noise voltage and the noise electric field strength.
- [Rectifier Circuit]

The input current is rectified by D1 and charges C9 to make DC voltage. Then it supplies power to the converter circuit.
- [Kick-on Voltage Circuit]

Bias is applied to the Q1 gate via this circuit when the AC power is turned on and Q1 begins operating.

10.1. Heat Lamp Control Circuit

The fixing unit are used at high temperature, so that 2 temperature fuses are equipped as a thermistor and a safety device to control the temperature.

The circuit consists of the temperature detection unit, output control unit, and overheat detection unit.

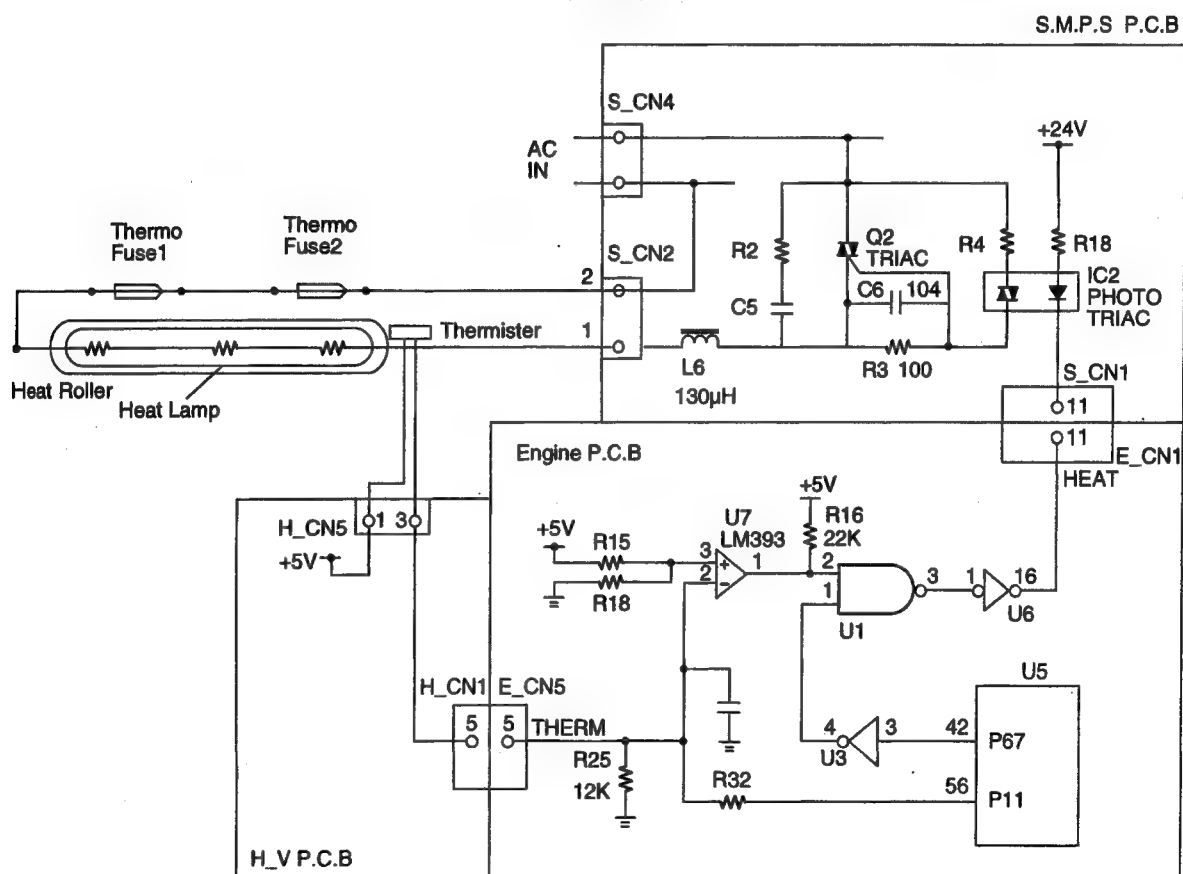
The heat roller fixing temperature is set to approximately 150°C.

The voltage of thermistor which touches the heat roller is monitored, and controlled to keep a stable temperature of heat lamp by the TRIAC.

When the heater temperature becomes over 175°C (for a minute), "UNIT OVERHEATED" appears and the heat lamp is turned OFF forcibly.

When the temperature does not go high normally because of the fault of the heater control unit, "CALL SERVICE FS" appears.

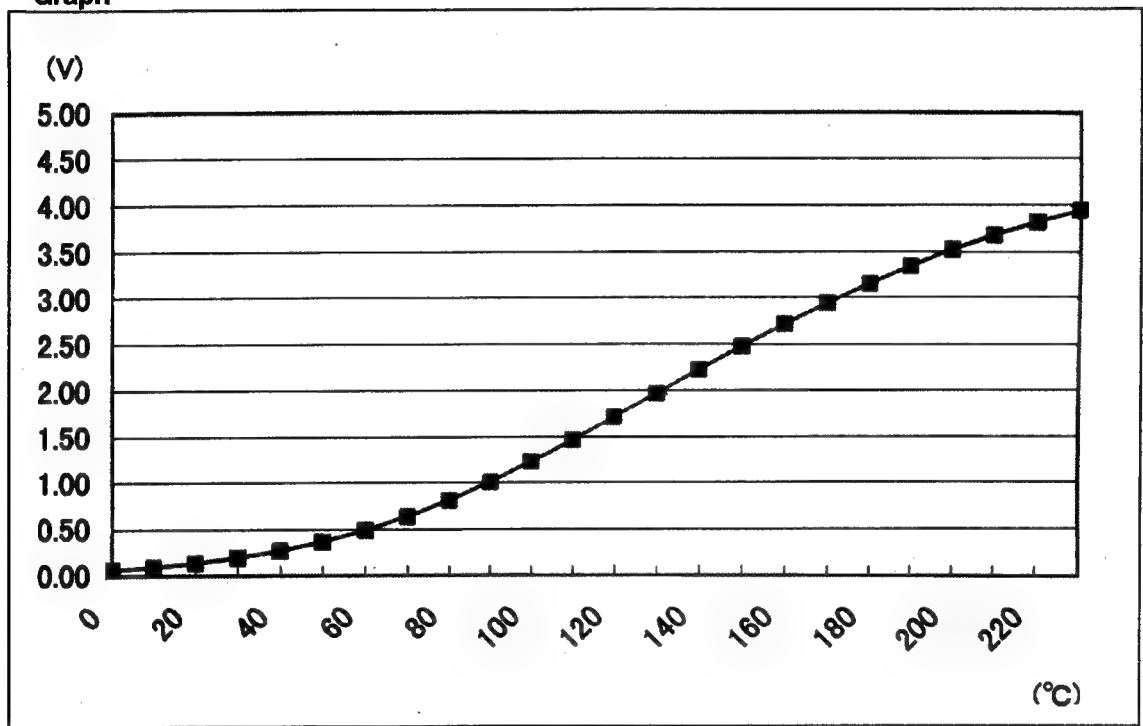
Circuit Diagram



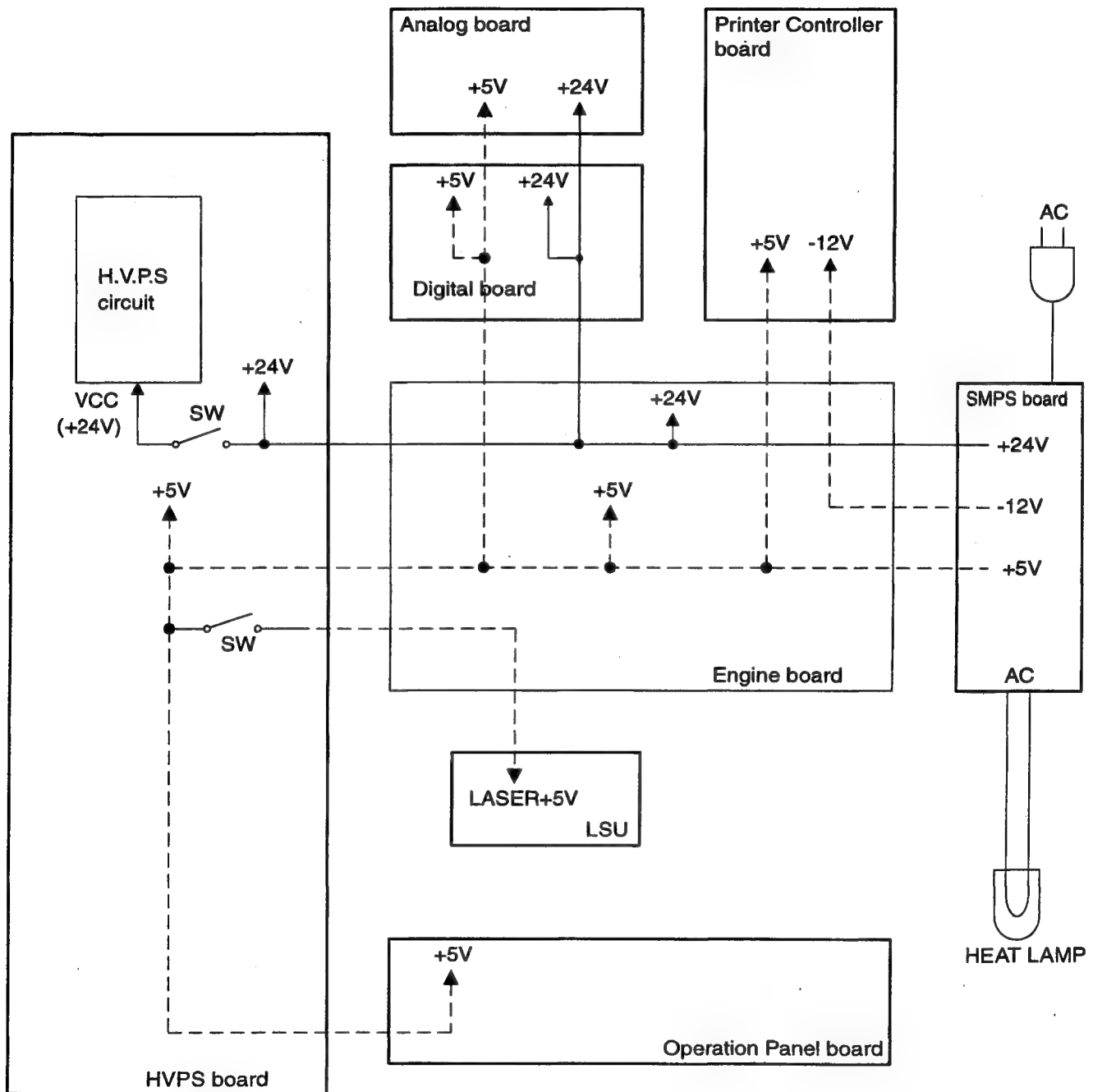
Table

Temperature (°C)	Registor Value (K Ω)	Voltage at pin56 of U5 (V)
20	440	0.13
30	300	0.19
100	37	1.22
150	12	2.48
170	8.4	2.95
180	7	3.15

Graph



10.2 POWER SUPPLY FLOW



SMPS P.C.B generates +5V, +24V and -12V powers.

Each power is used for

- 12V: U12(amplifier) on ICU only.
- +24V: MOTOR,polygon motor, FAN, high voltage circuit, and amplifier on ANALOG board.
- +5V: other logic.

PRINTED CIRCUIT BOARD / SCHEMATIC DIAGRAM (HOOK SWITCH)

1

2

3

4

5

6

7

8

9

10

11

12

A

B

C

D

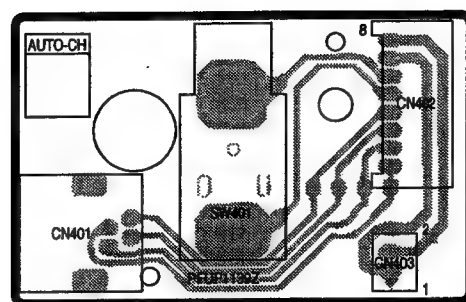
E

F

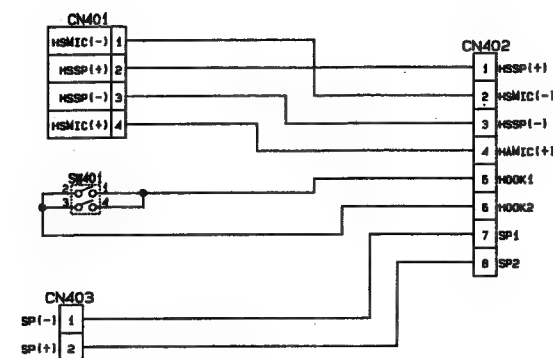
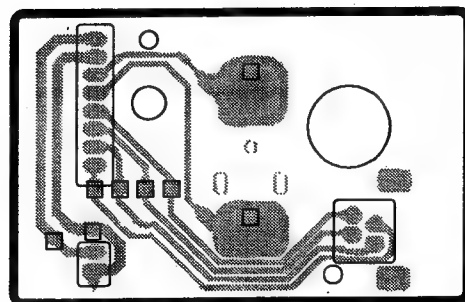
G

H

(COMPONENT VIEW)



(BOTTOM VIEW)



KX-FLM600G

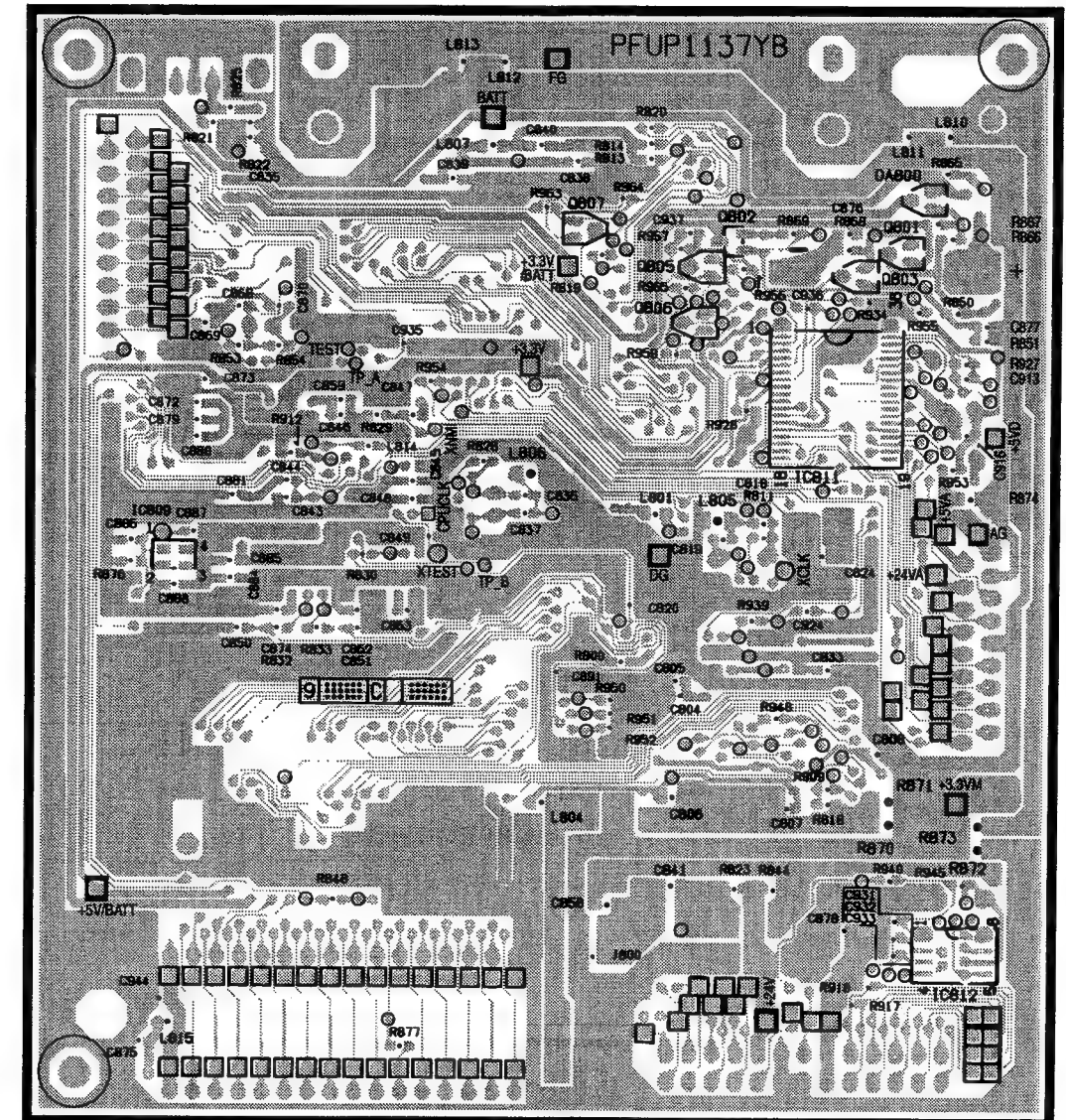
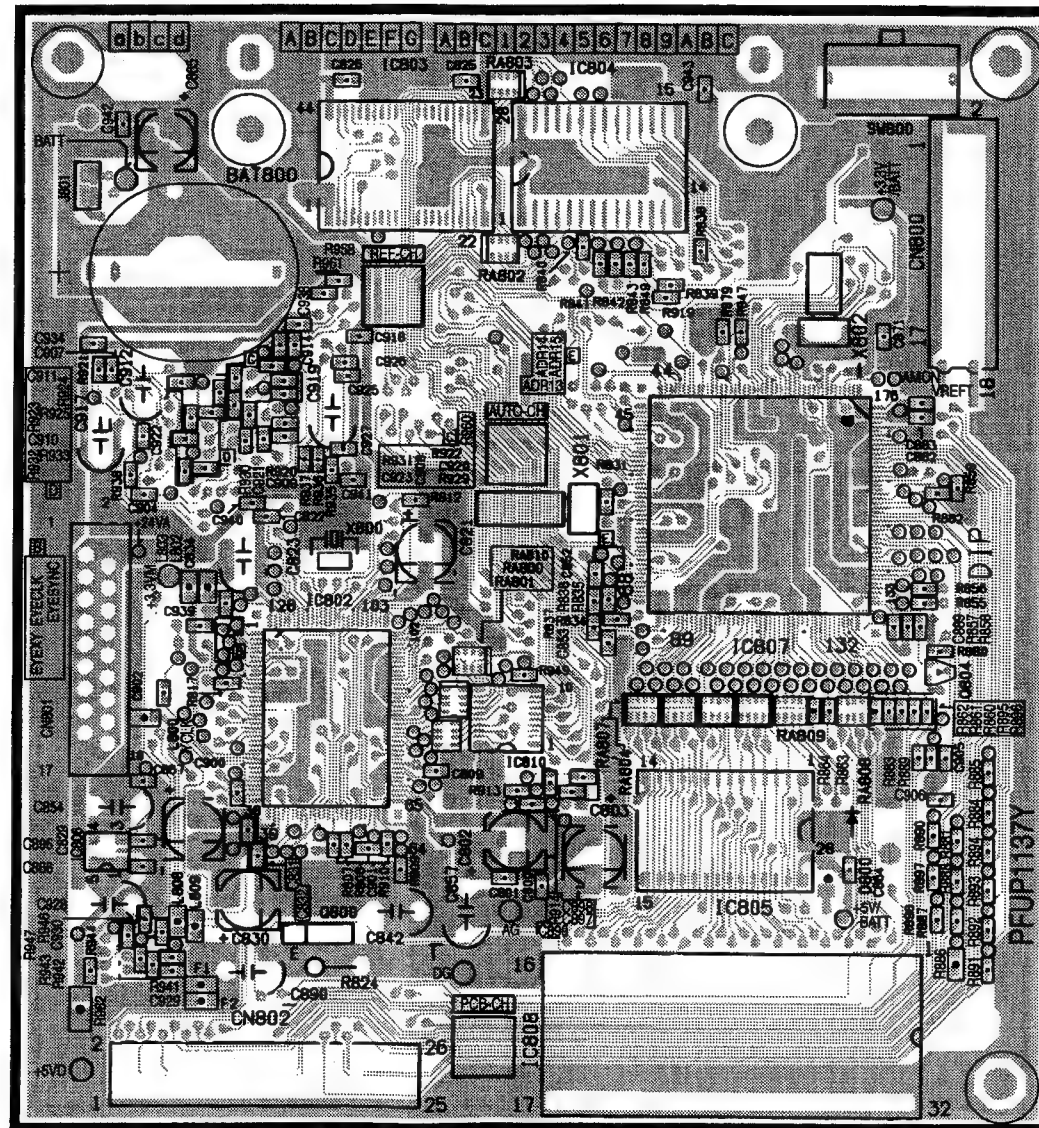
KX-FLM600G

PRINTED CIRCUIT BOARD (DIGITAL)

1 2 3 4 5 6 7 8 9 10 11 12

(COMPONENT VIEW)

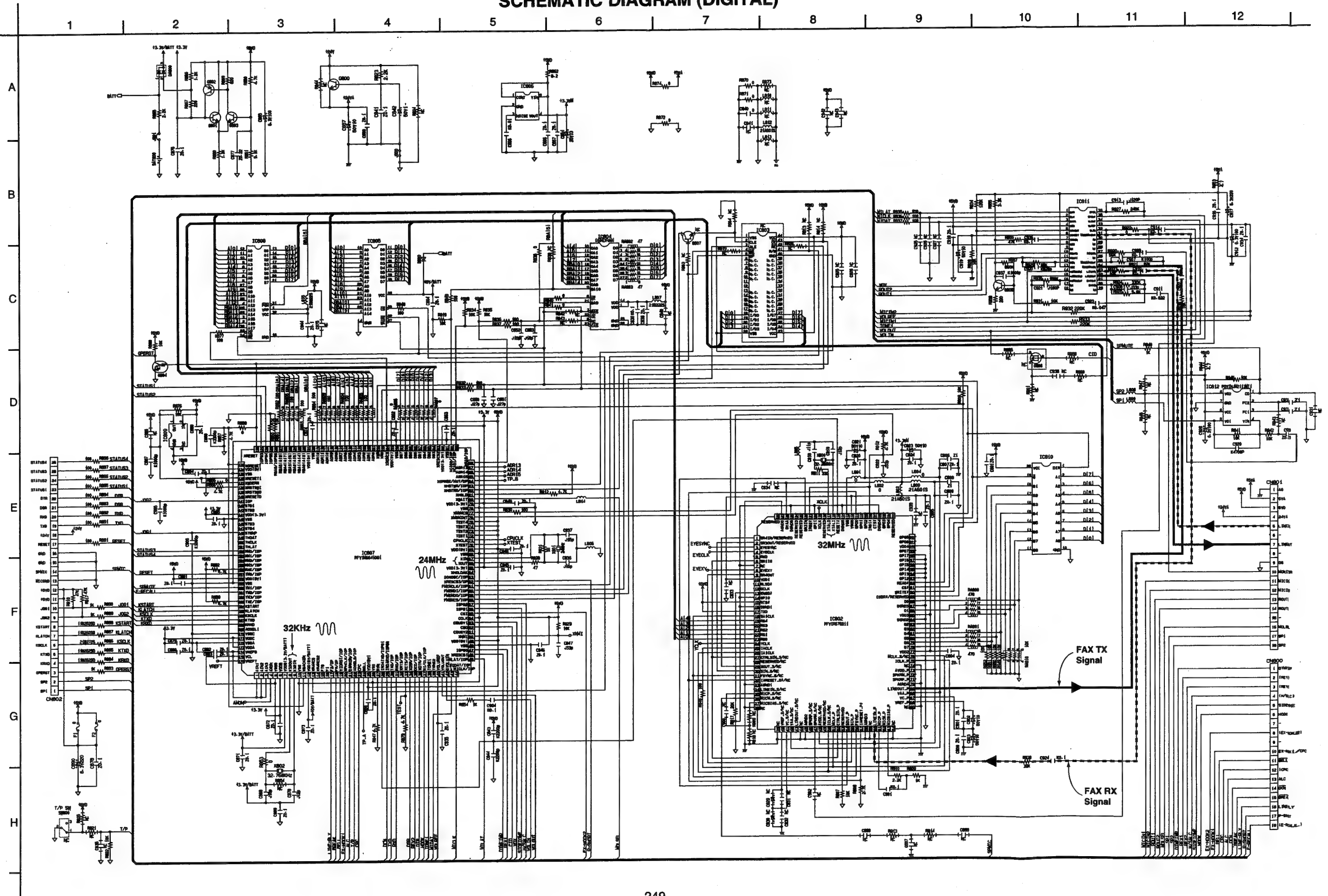
(BOTTOM VIEW)



KX-FLM600G

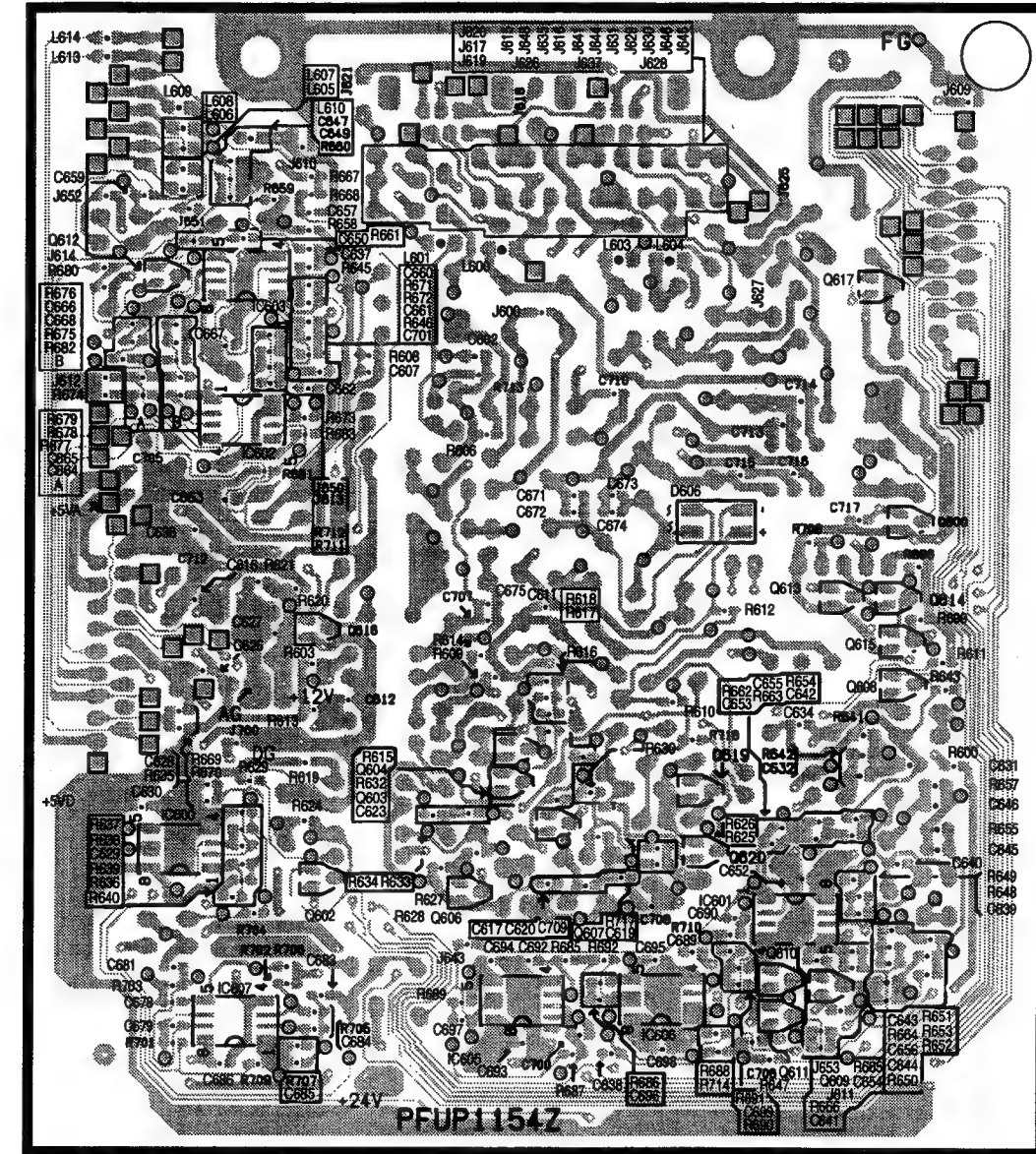
KX-FLM600G

SCHEMATIC DIAGRAM (DIGITAL)



1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----

(BOTTOM VIEW)

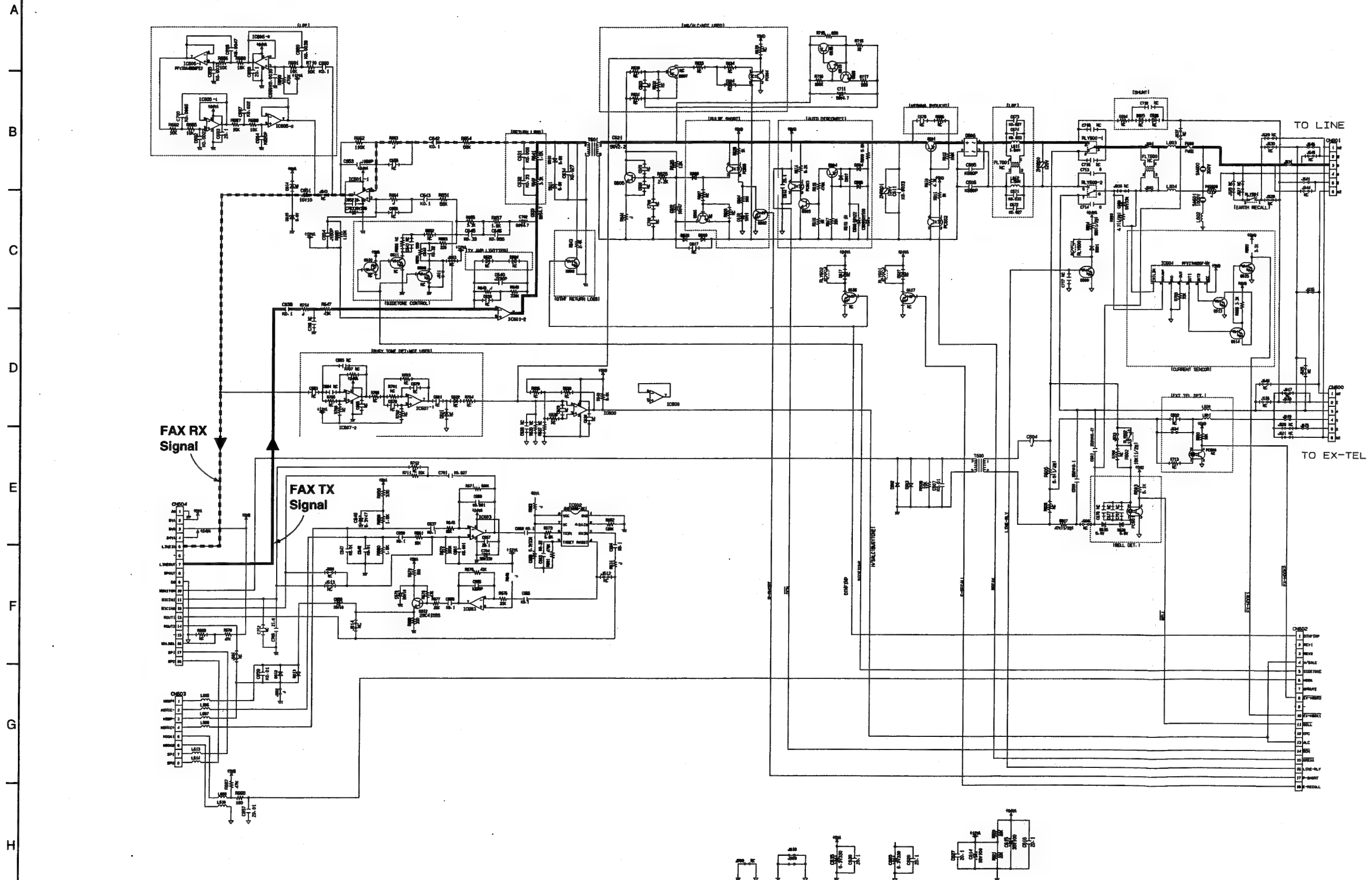


KX-FLM600G

KX-FLM600G

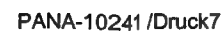
SCHEMATIC DIAGRAM (ANALOG)

1 2 3 4 5 6 7 8 9 10 11 12



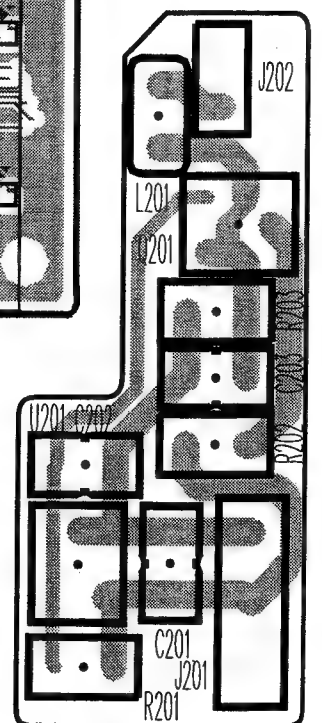
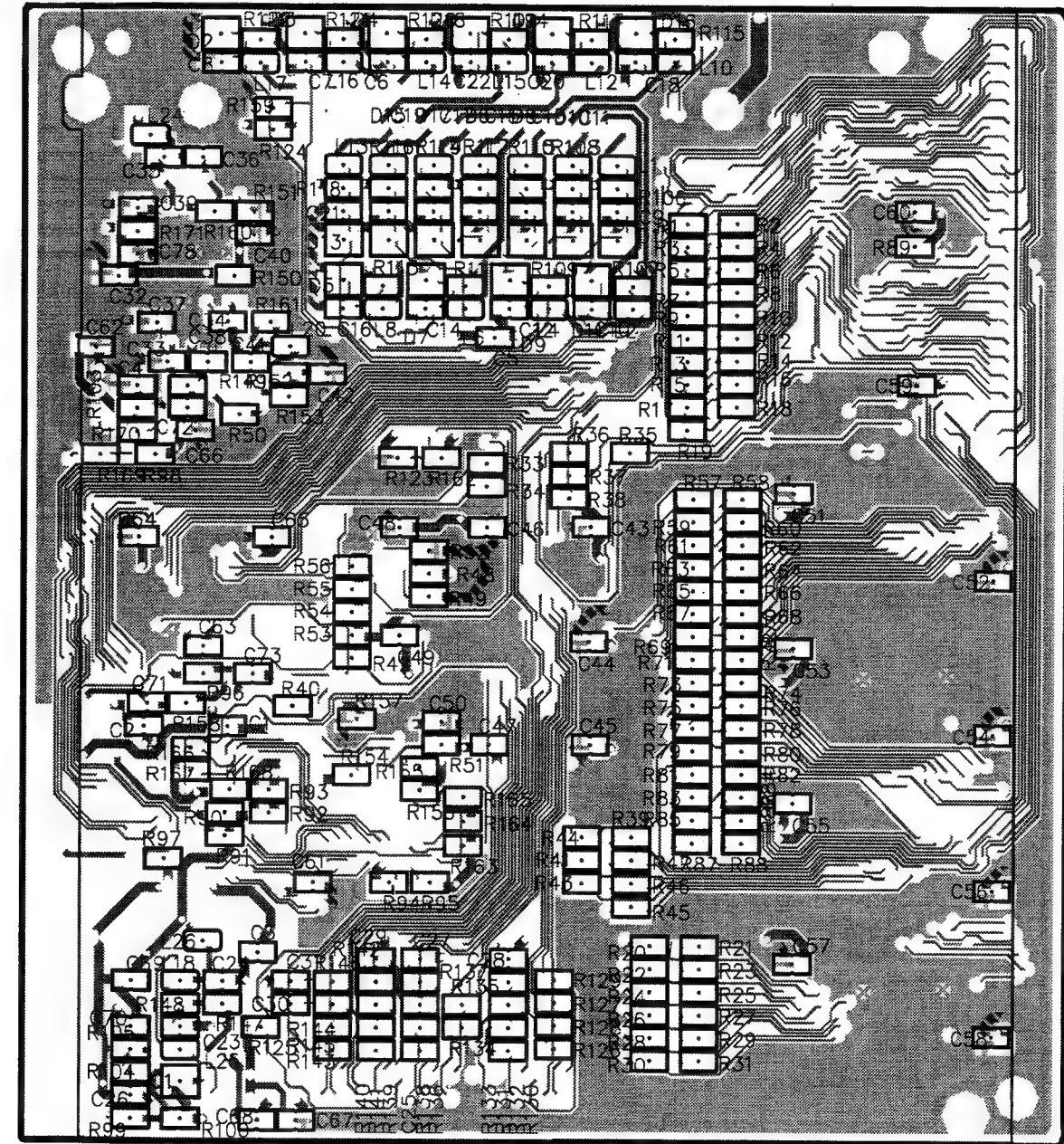
KX-FLM600G

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----



KX-FLM600G

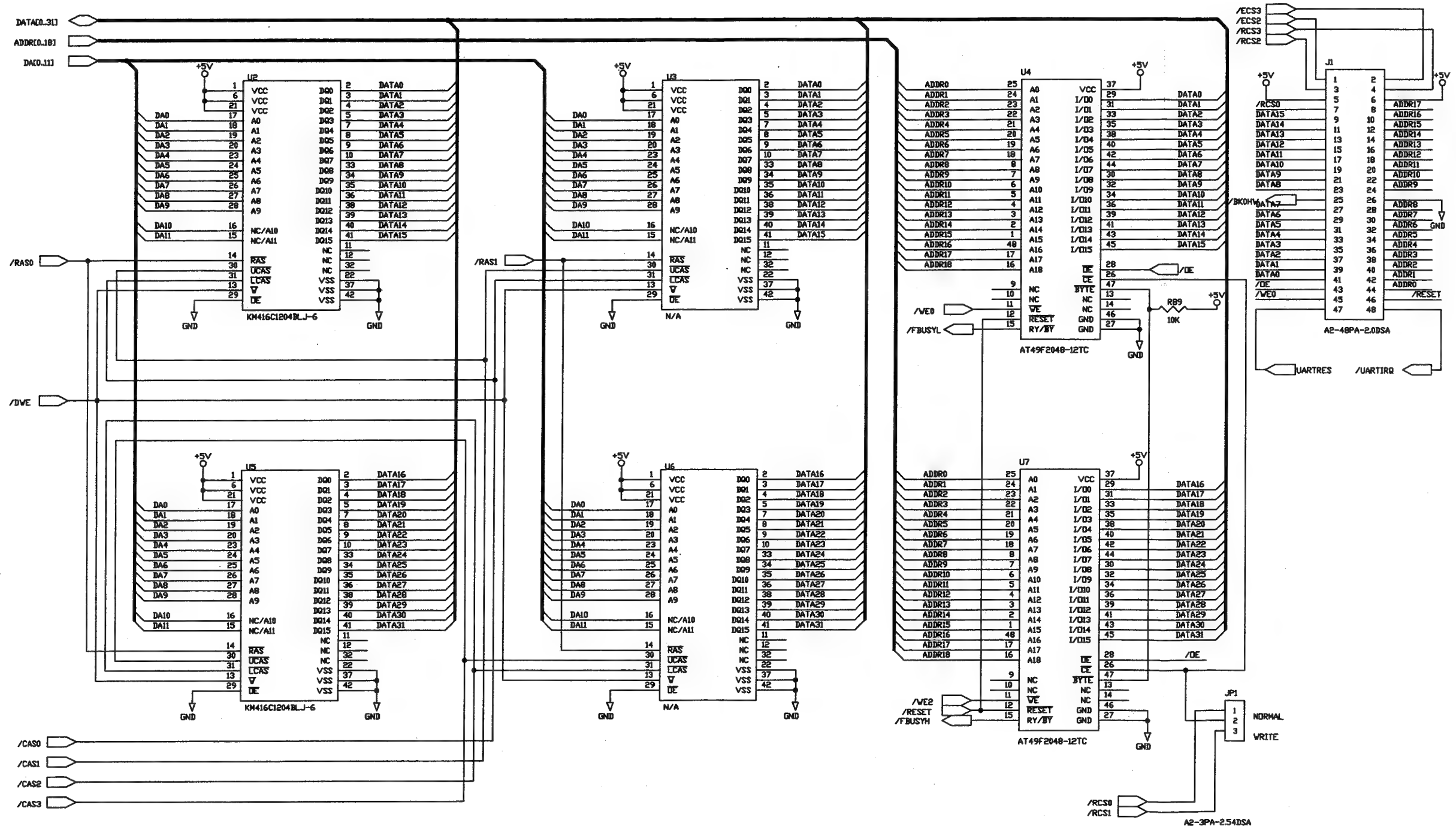
1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----



KX-FLM600G

KX-FLM600G

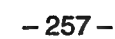
SCHEMATIC DIAGRAM (PRINTER CONTROL 1/5)



KX-FLM600G



1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----



KX-FLM600G

KX-FLM600G

PRINTED CIRCUIT BOARD (PRINTER CONTROL 4/5)

1 2 3 4 5 6 7 8 9 10 11 12

A

B

C

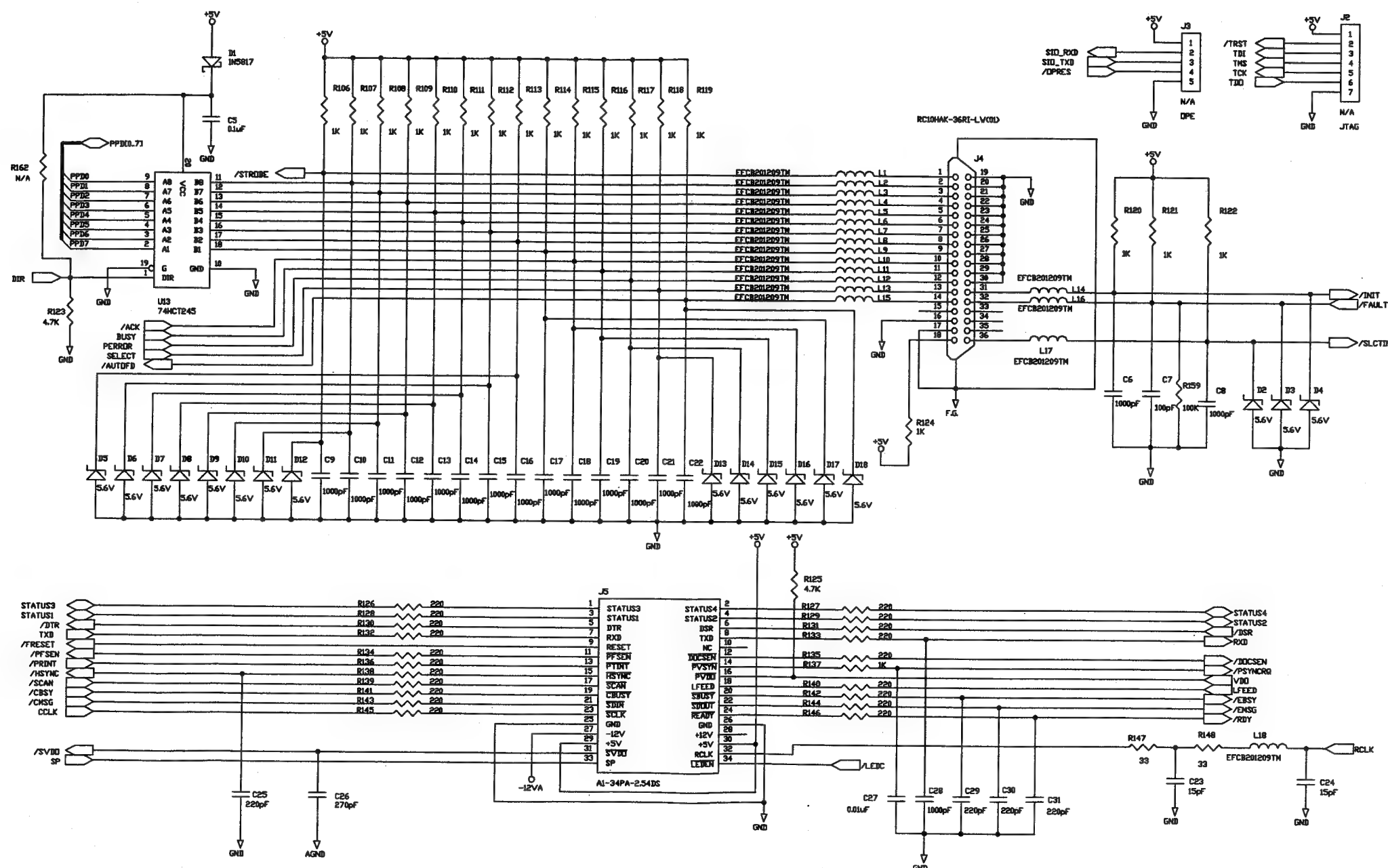
D

E

F

G

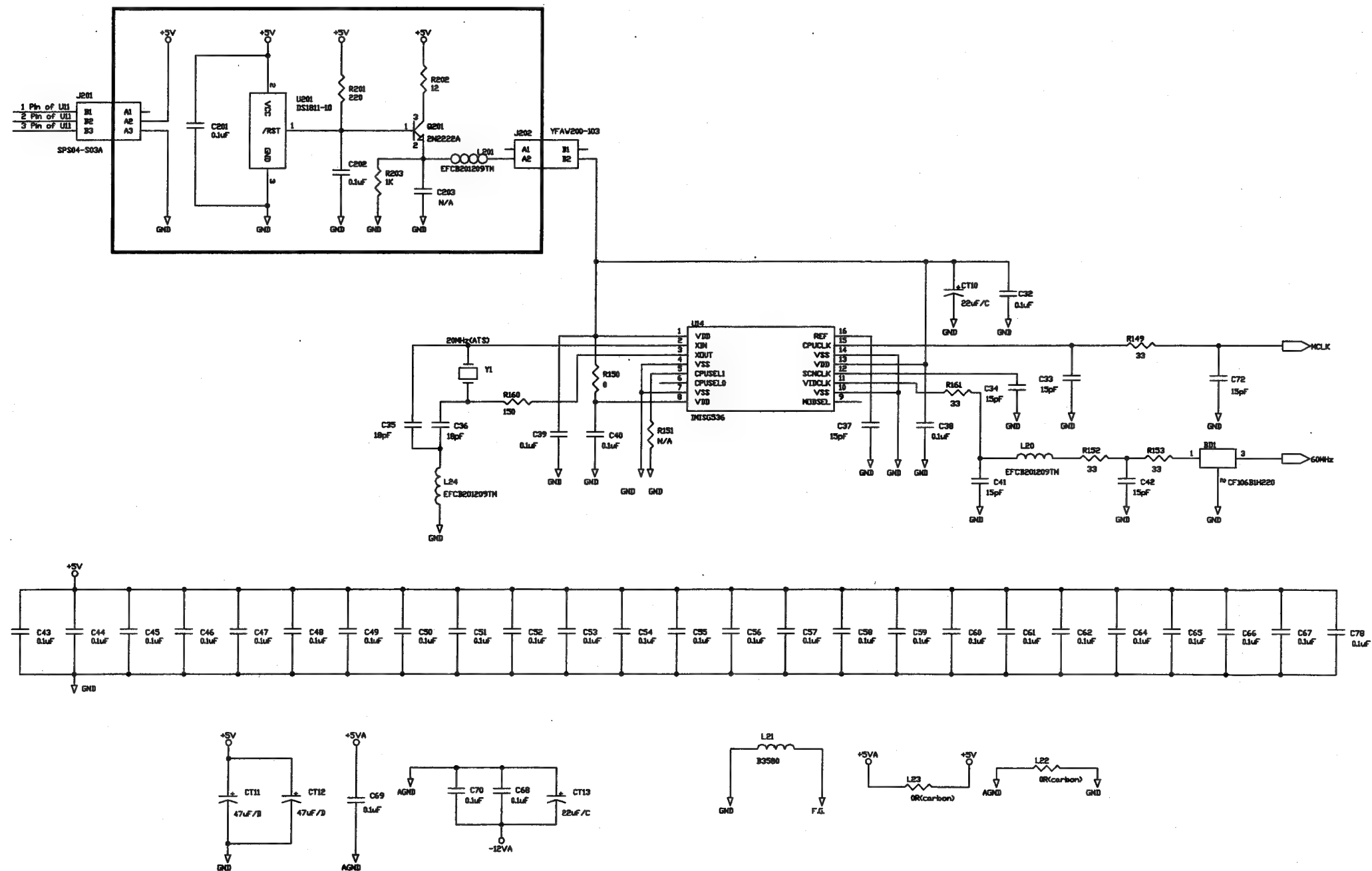
H



KX-FLM600G

KX-FLM600G

PRINTED CIRCUIT BOARD (PRINTER CONTROL 5/5)



KX-FLM600G

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----



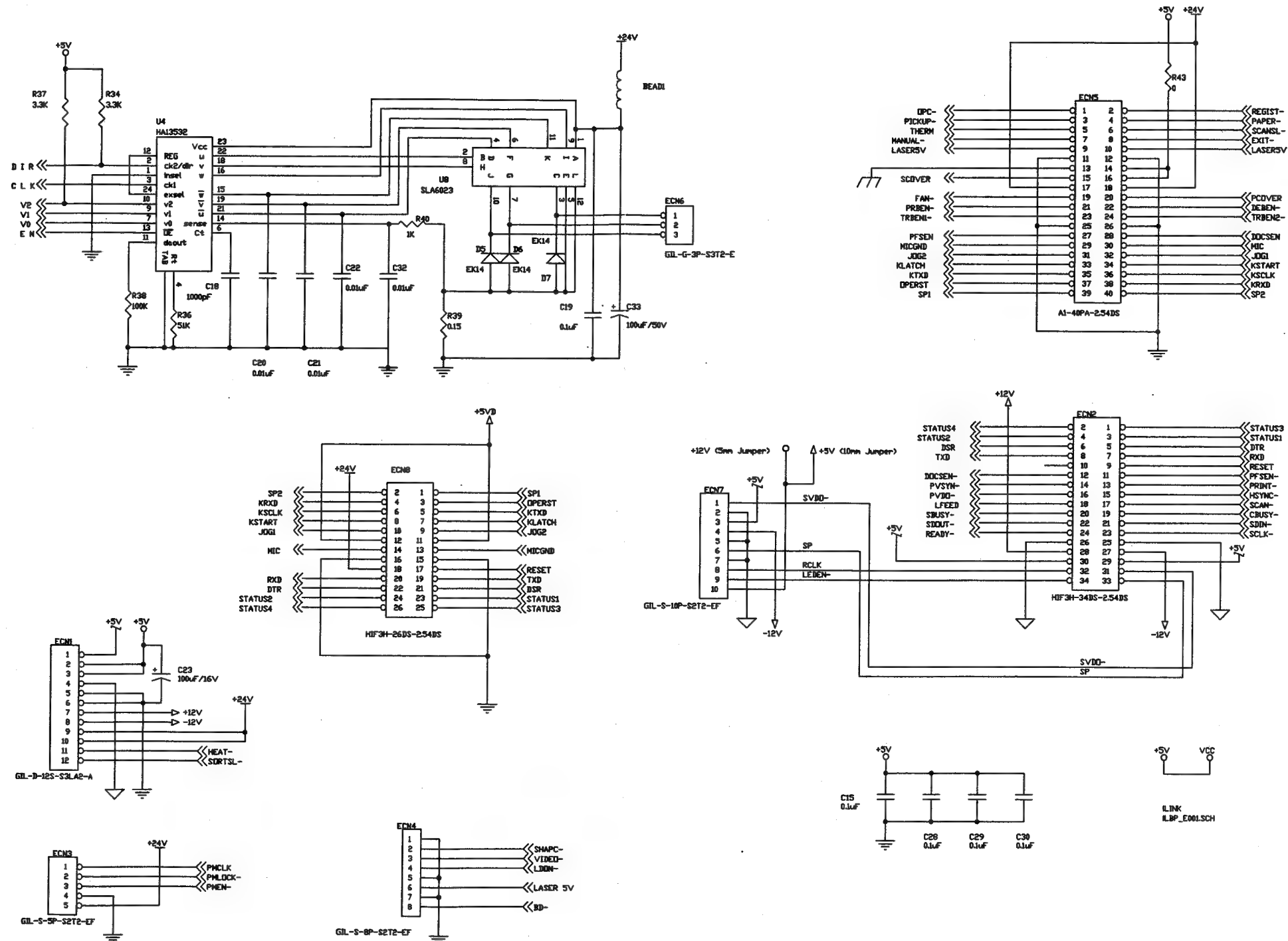
1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----



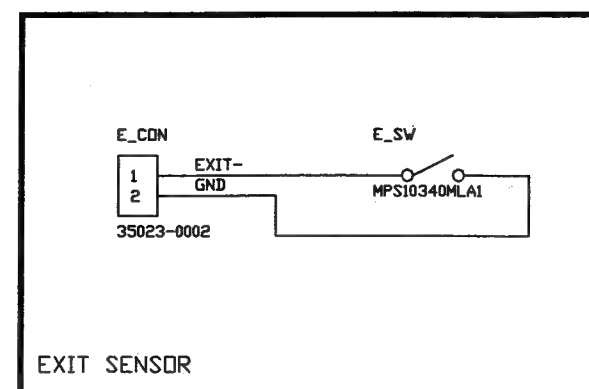
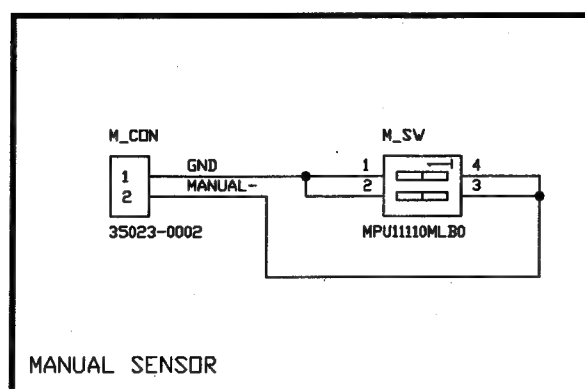
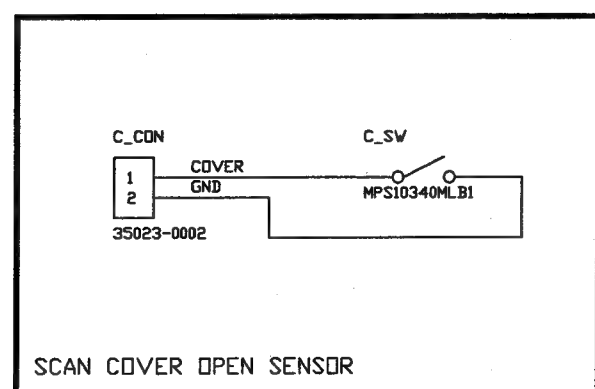
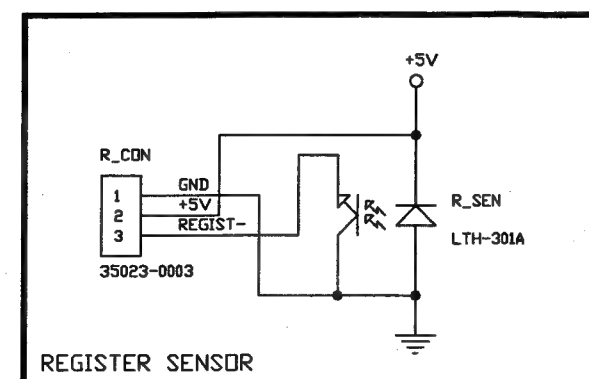
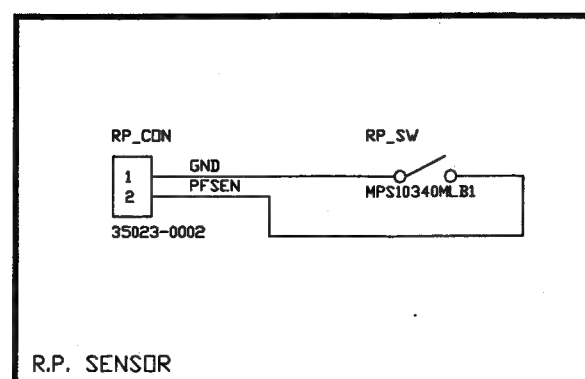
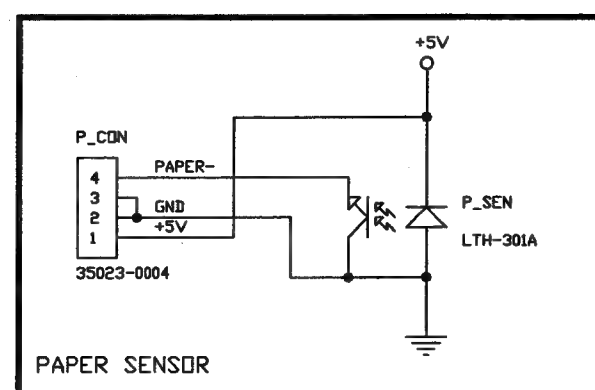
KX-FLM600G

KX-FLM600G

SCHEMATIC DIAGRAM (ENGINE 2/2)



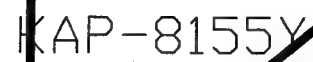
SCHEMATIC DIAGRAM (SENSORS)



(See page 260)

KX-FLM600G

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----



WARNING!
HIGH VOLTAGE

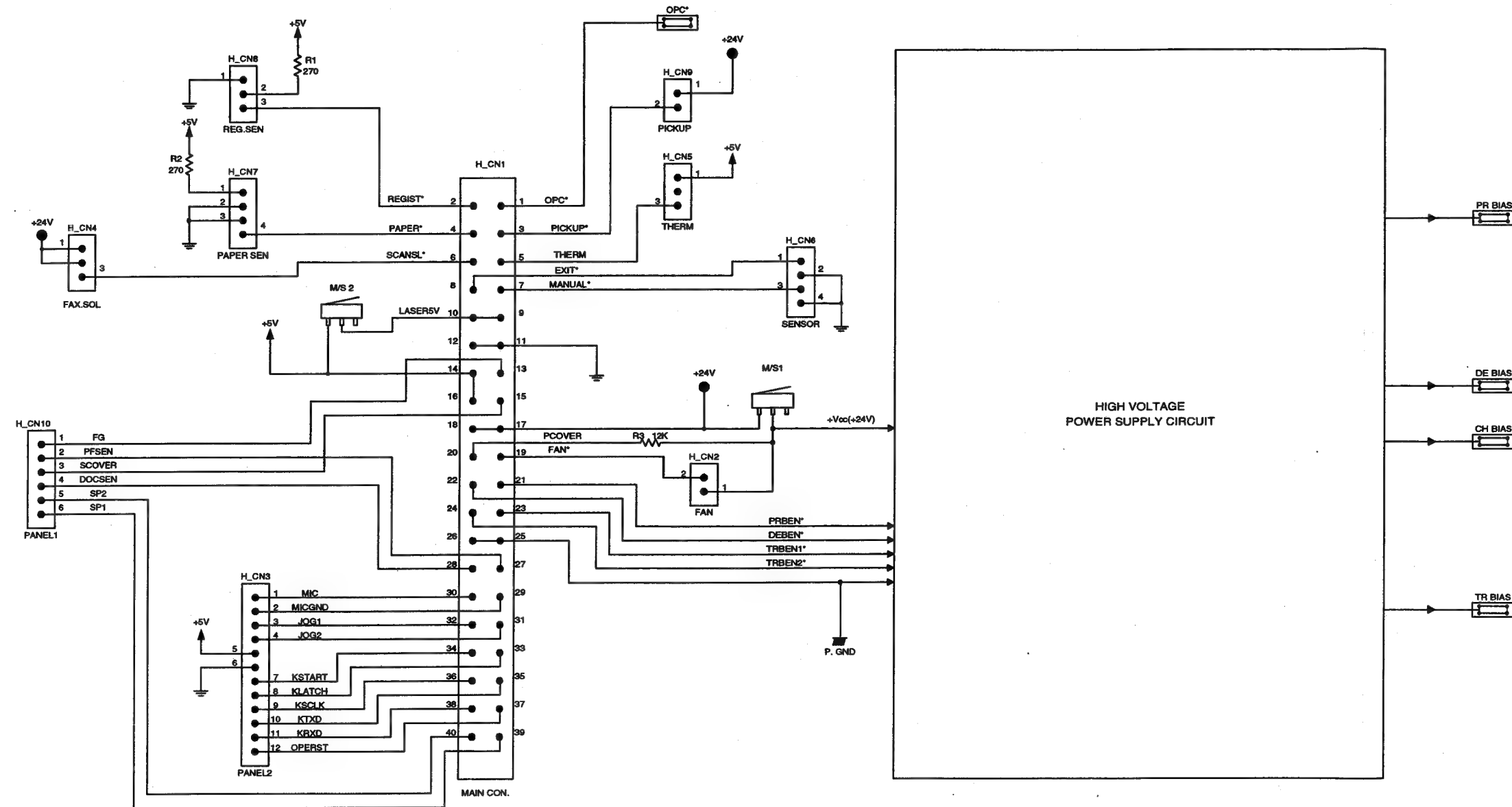
KAC KAP-8155Y
Korea Asahi Ver 12

LABEL

KX-FLM600G

KX-FLM600G

SCHEMATIC DIAGRAM (H.V.P.S 1/2)



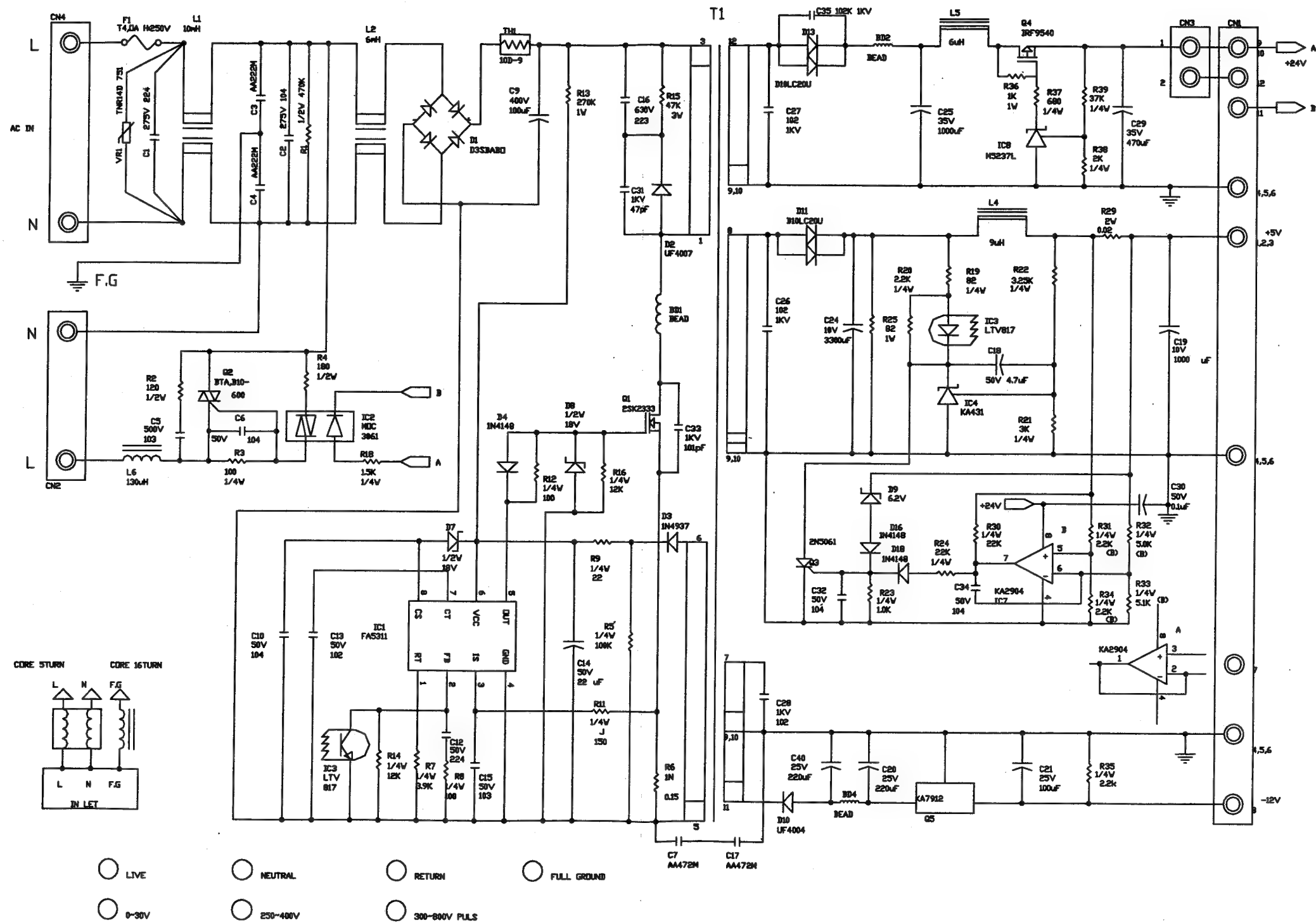
Note :

H_CN1 : HIF3H-40DA-2.54DSA / HIROSE	H_CN6 : GIL-S-4P-S2L2-EF / LGC	M/S 1, M/S 2 : MICRO SWITCH
H_CN2 : GIL-G-2P-S3T2-E / LGC	H_CN7 : GIL-S-3P-S2T2-EF / LGC	OPC*, PR BIAS, DE BIAS, CH BIAS, TR BIAS : JUMPER 2EA
H_CN3 : GIL-S-12P-S2L2-EF / LGC	H_CN8 : GIL-S-4P-S2T2-EF / LGC	
H_CN4 : GIL-G-3P-S3L2-E / LGC	H_CN9 : GIL-G-2P-S3T2-E / LGC	
H_CN5 : GIL-S-3P-S2L2-EF / LGC	H_CN10 : GIL-S-6P-S2L2-EF / LGC	

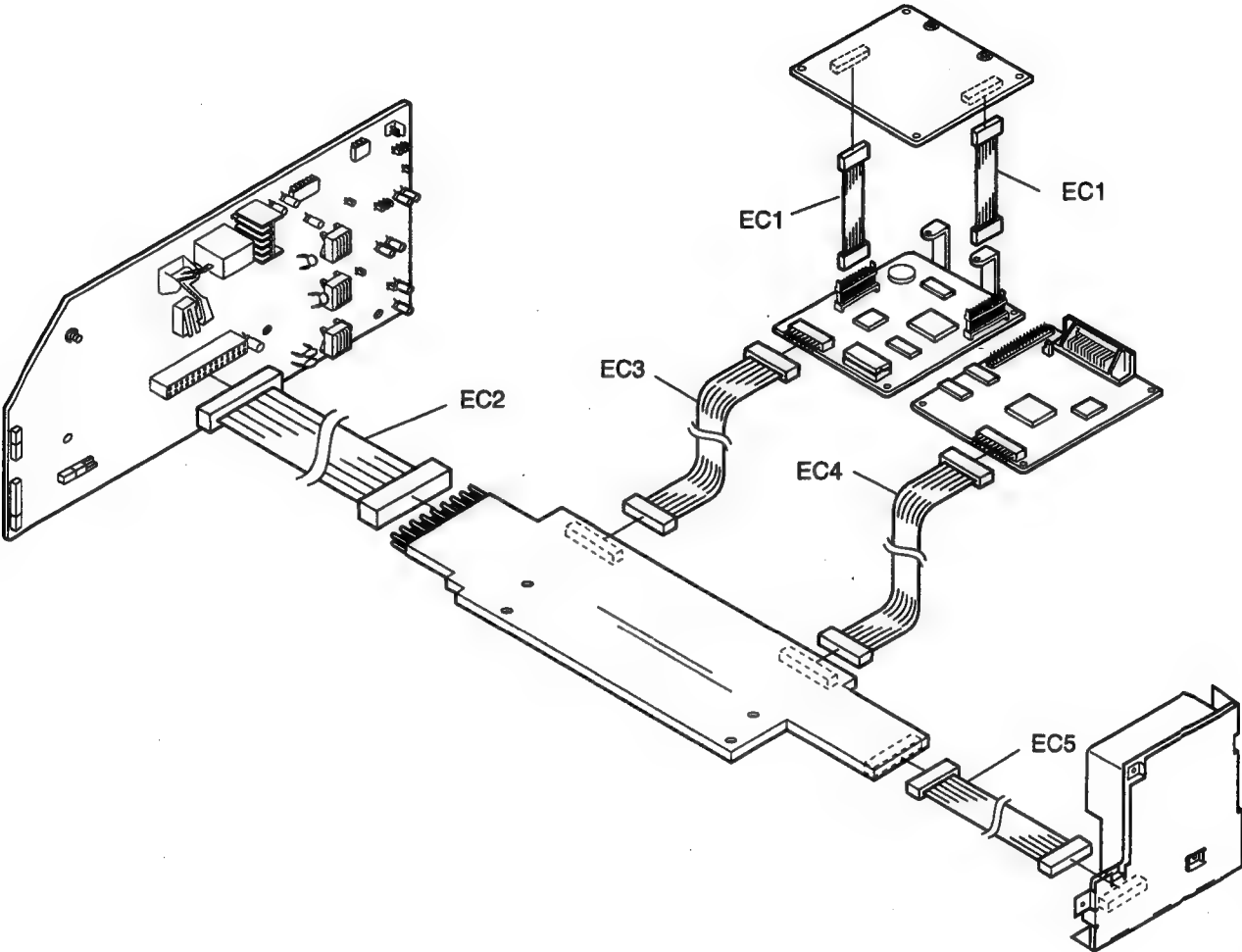
KX-FLM600G

KX-FLM600G

SCHEMATIC DIAGRAM (S.M.P.S)



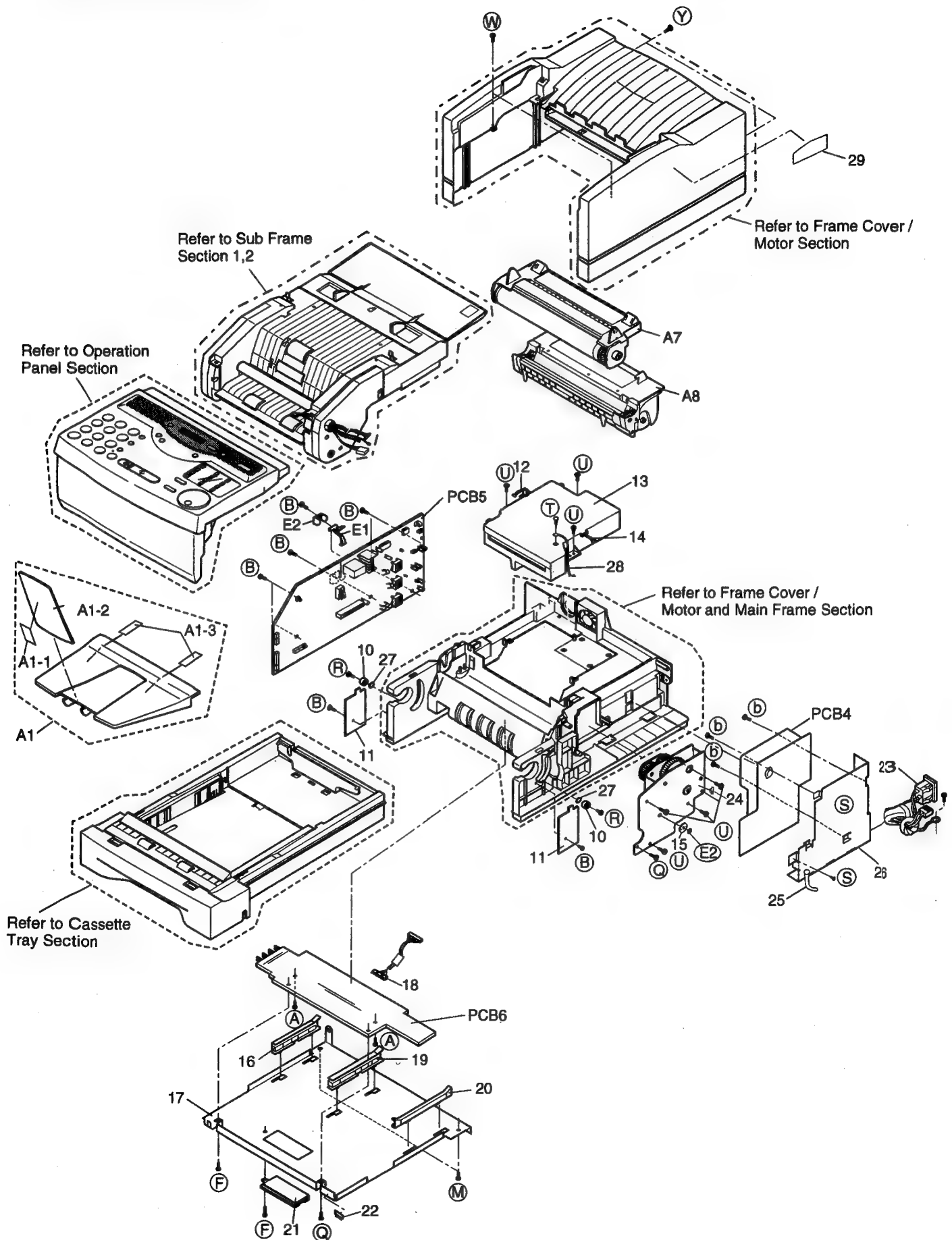
PICTURES AND TOOLS



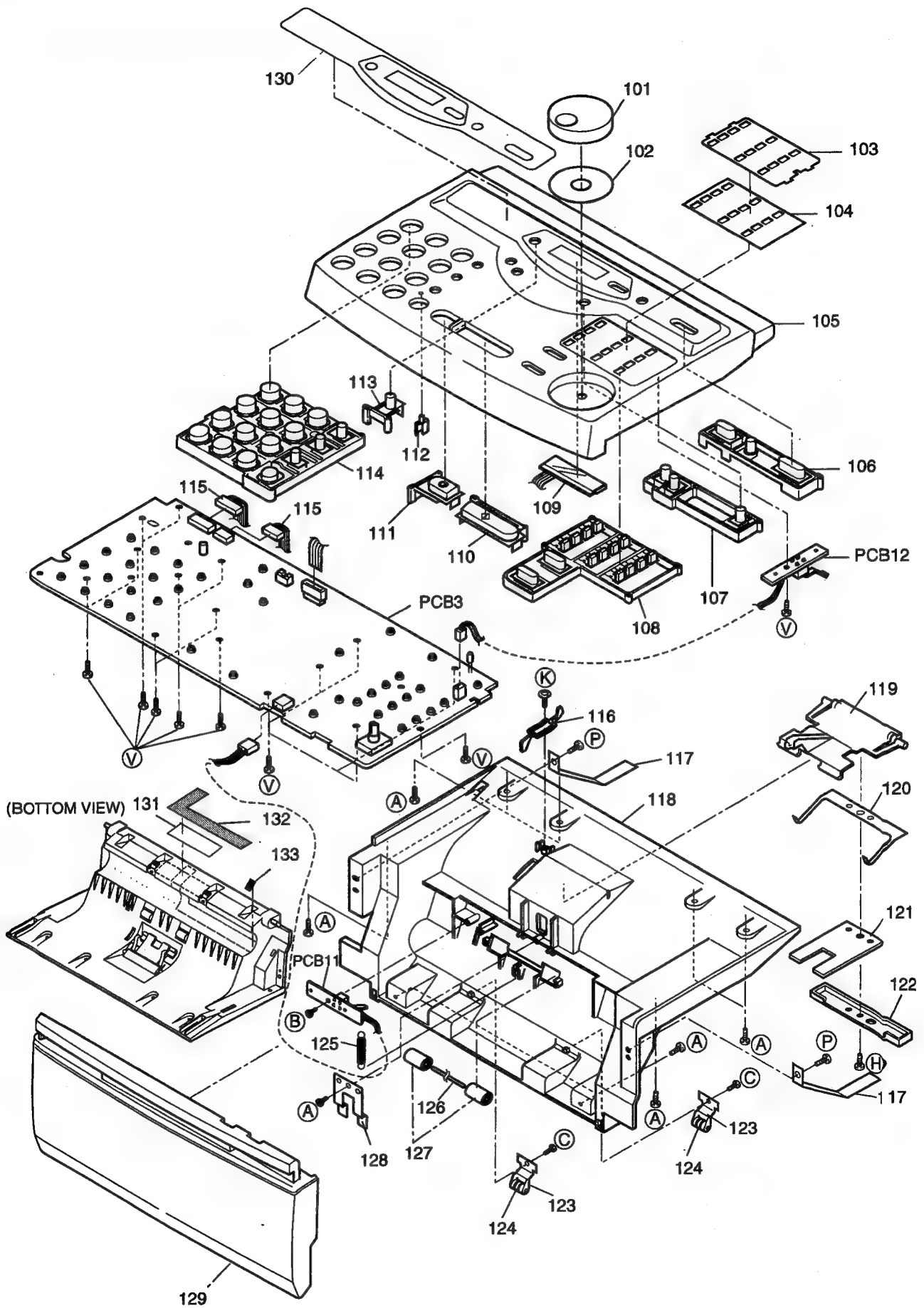
PARTS LOCATION

CABINET, MECHANICAL AND ELECTRICAL PARTS LOCATION

1. GENERAL SECTION

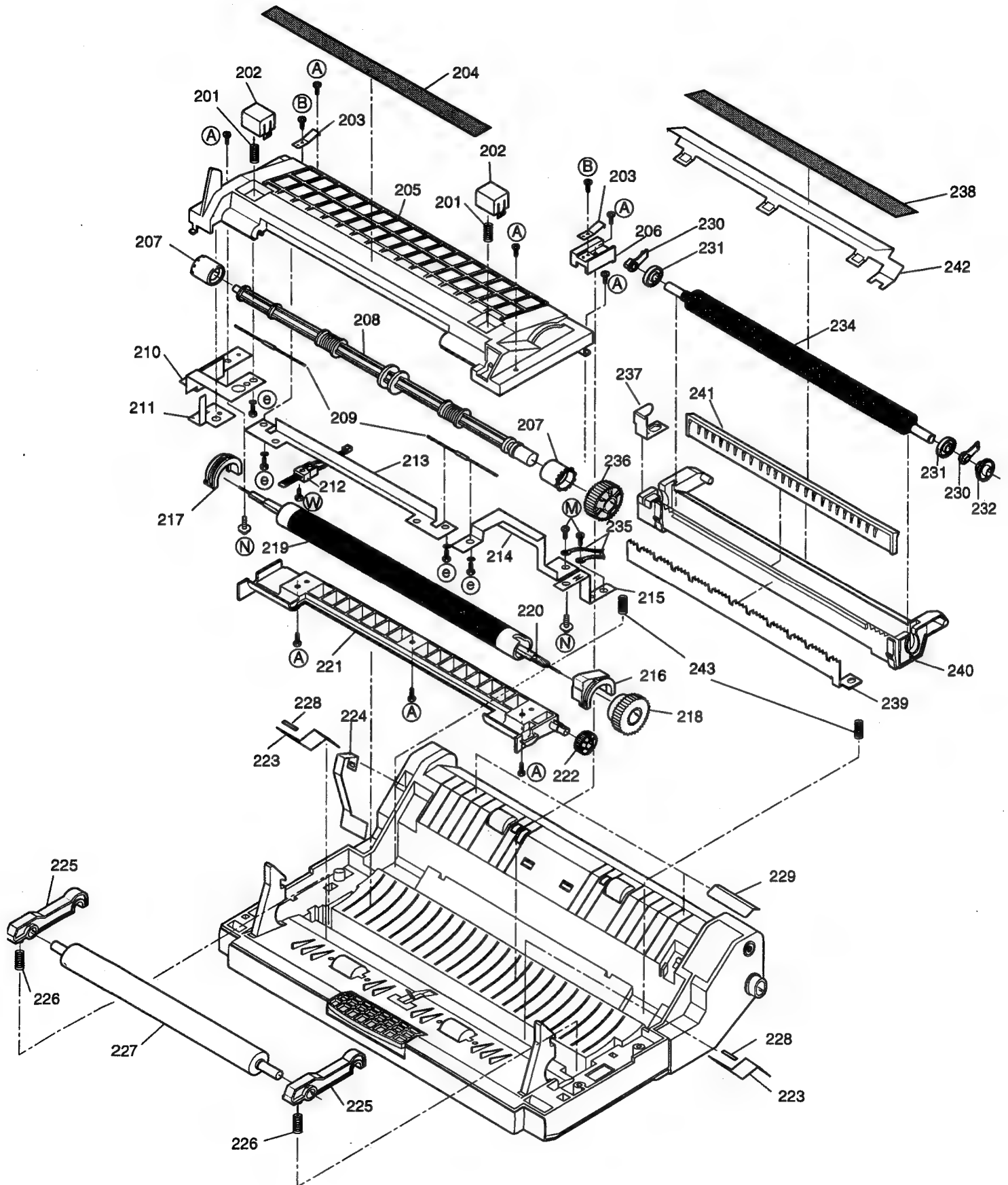


2. OPERATION PANEL SECTION

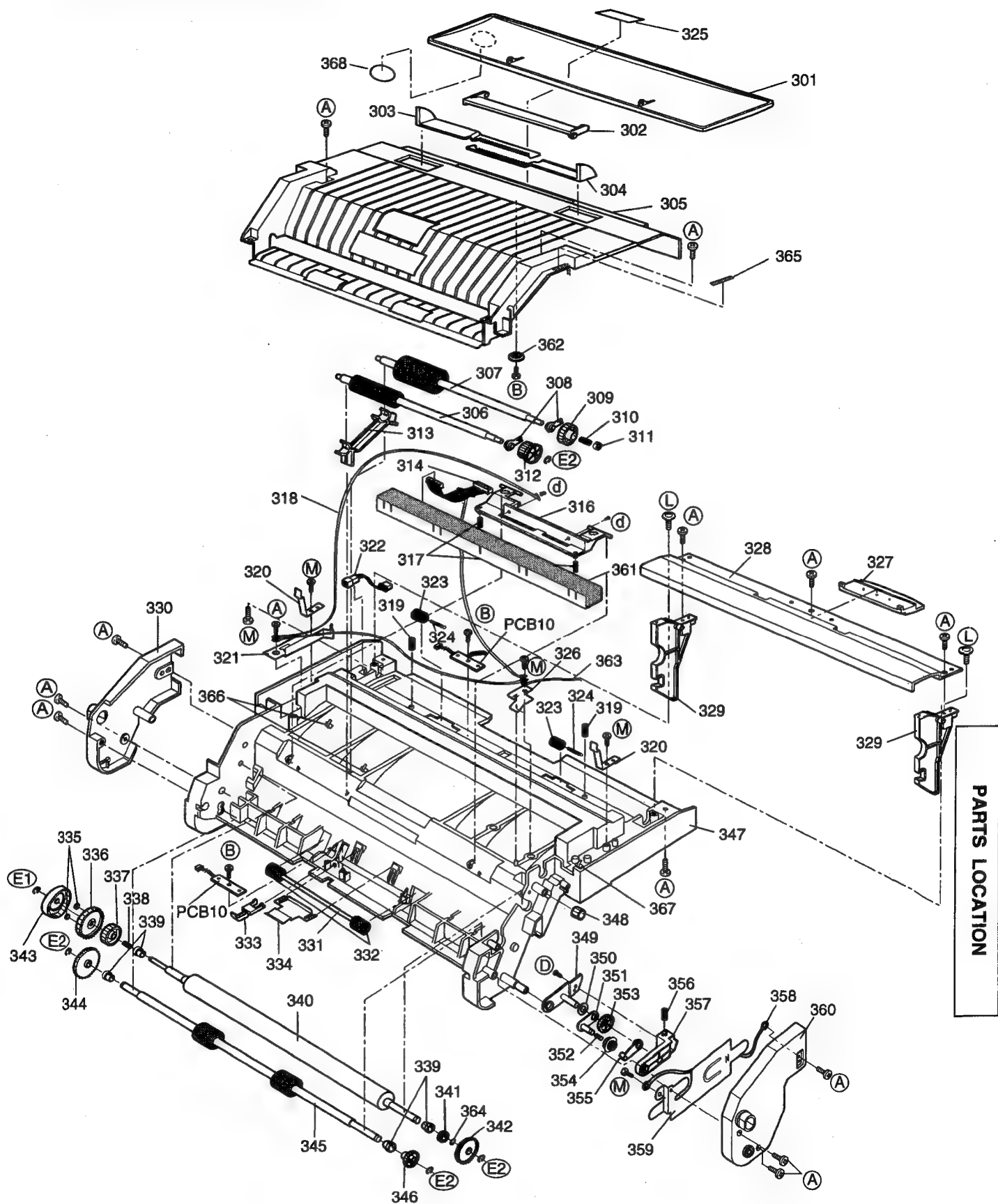


PARTS LOCATION

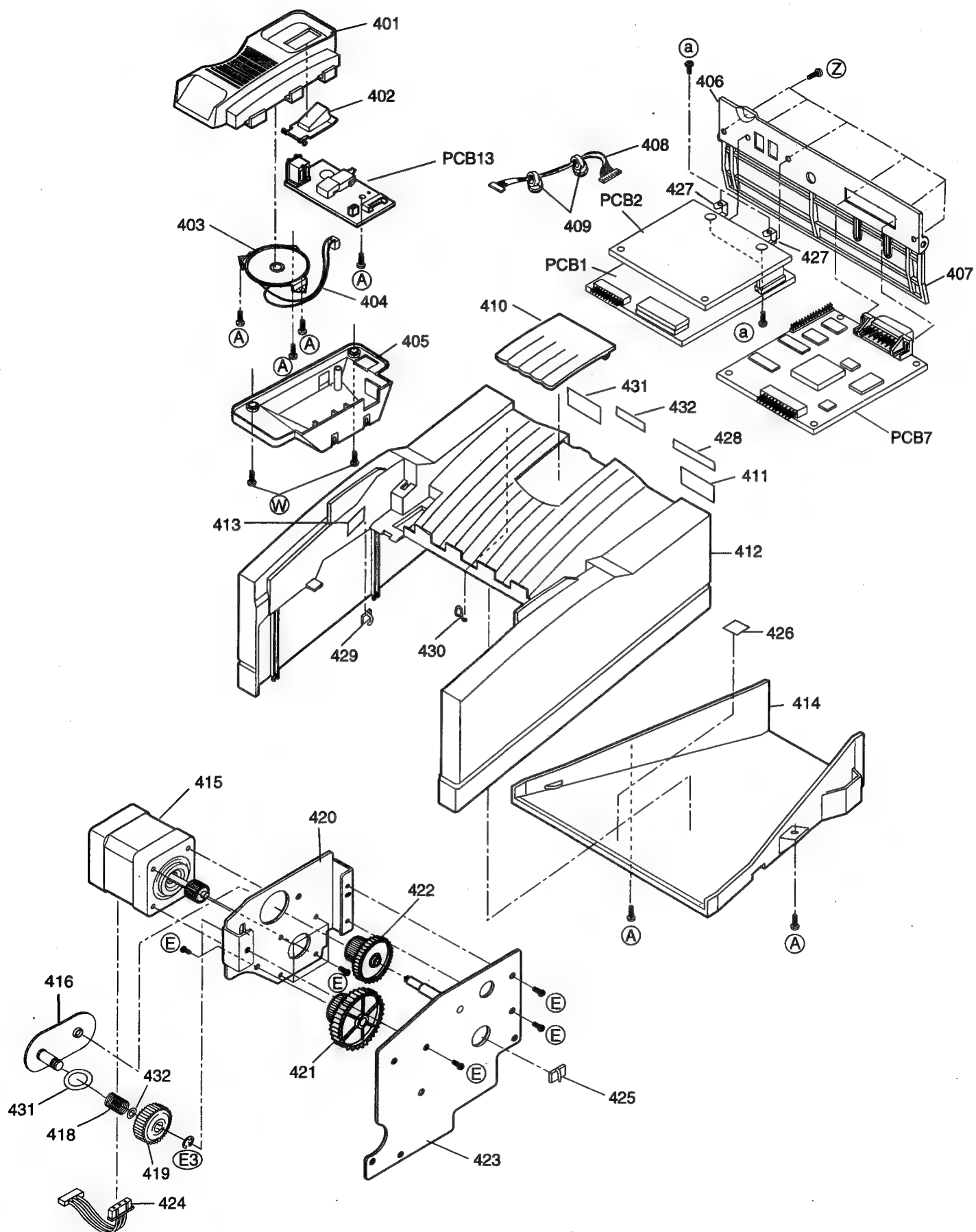
3. SUB FRAME SECTION1



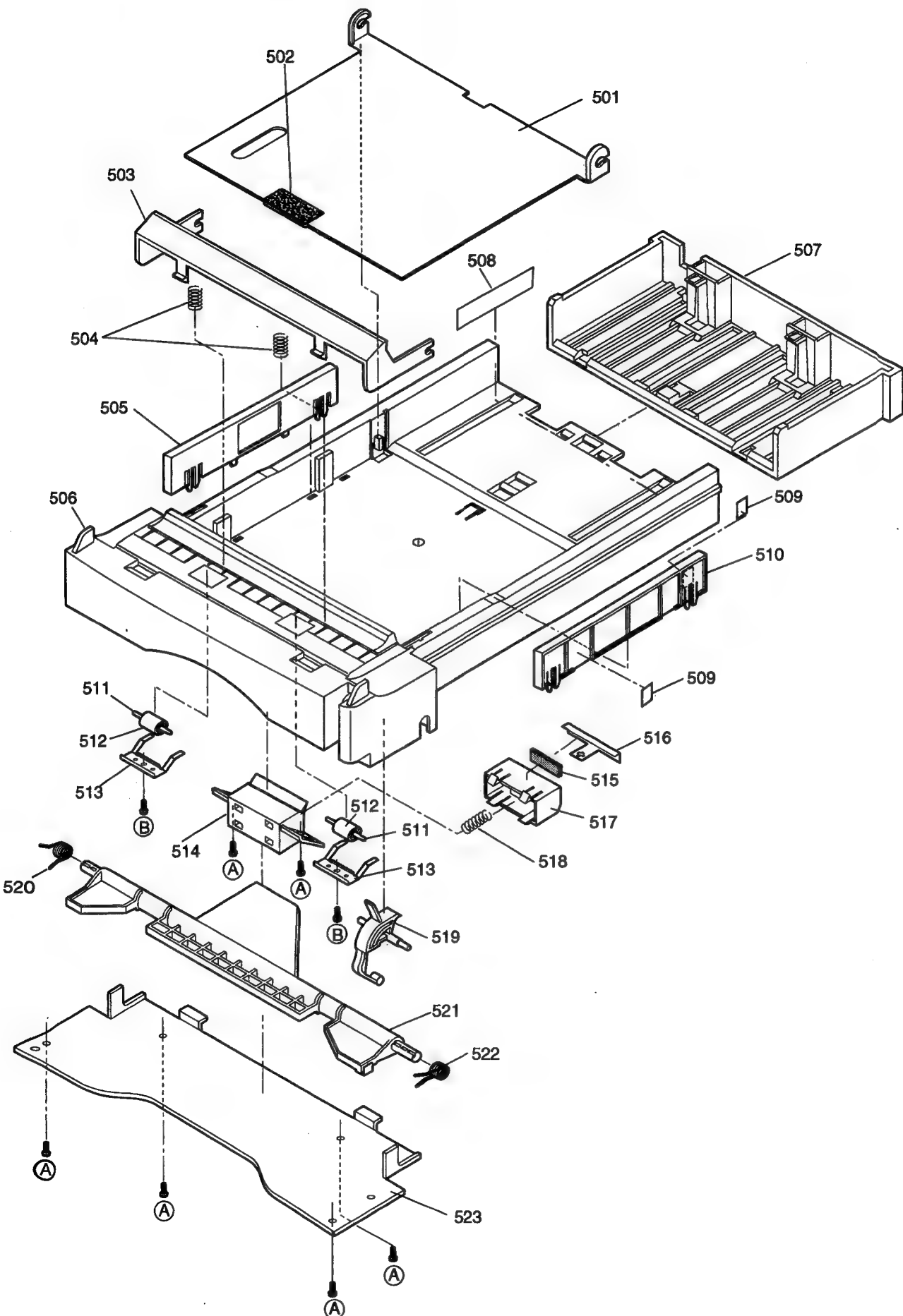
4. SUB FRAME SECTION2



5. FRAME COVER / MOTOR SECTION

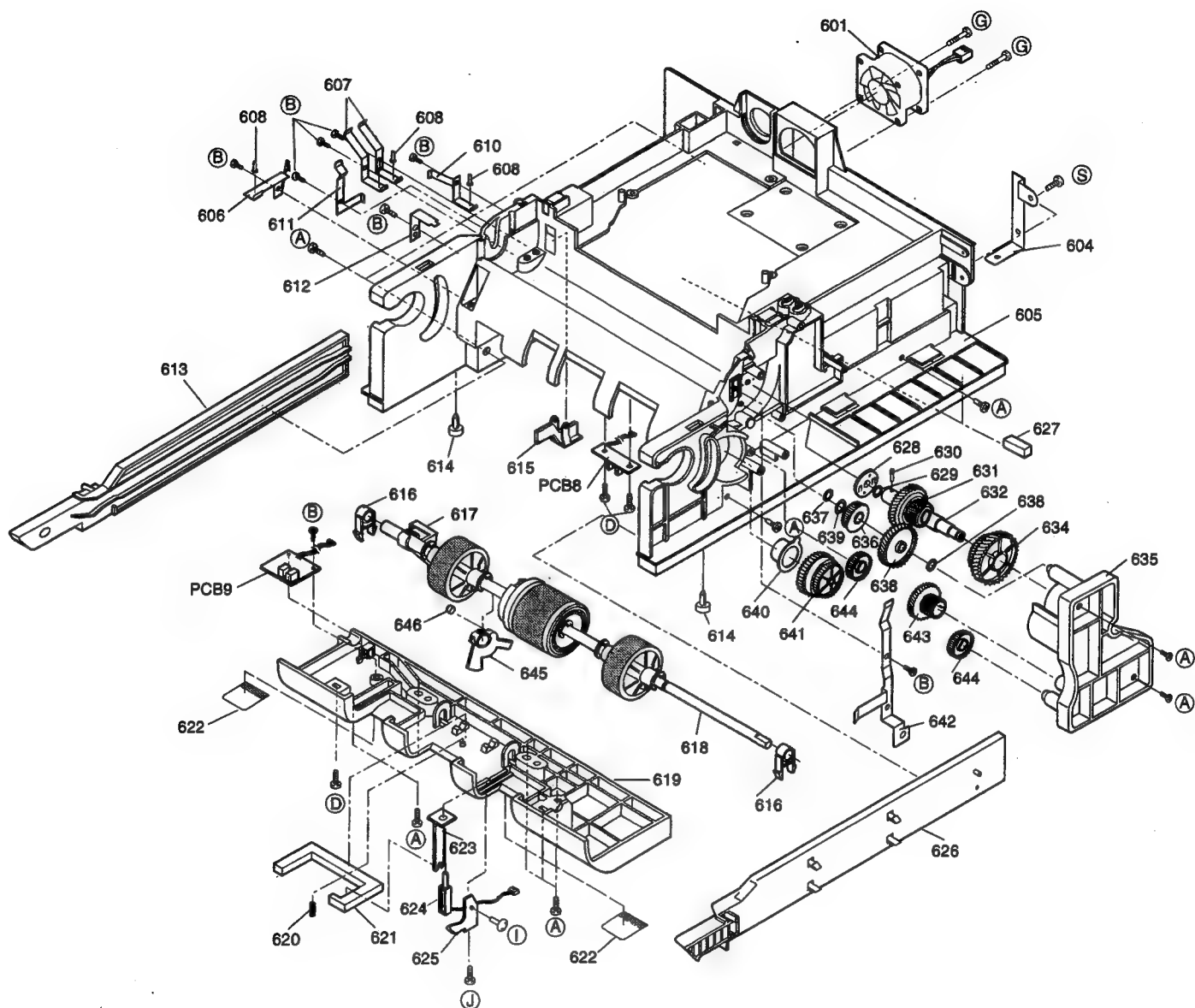


6. CASSETTE TRAY SECTION

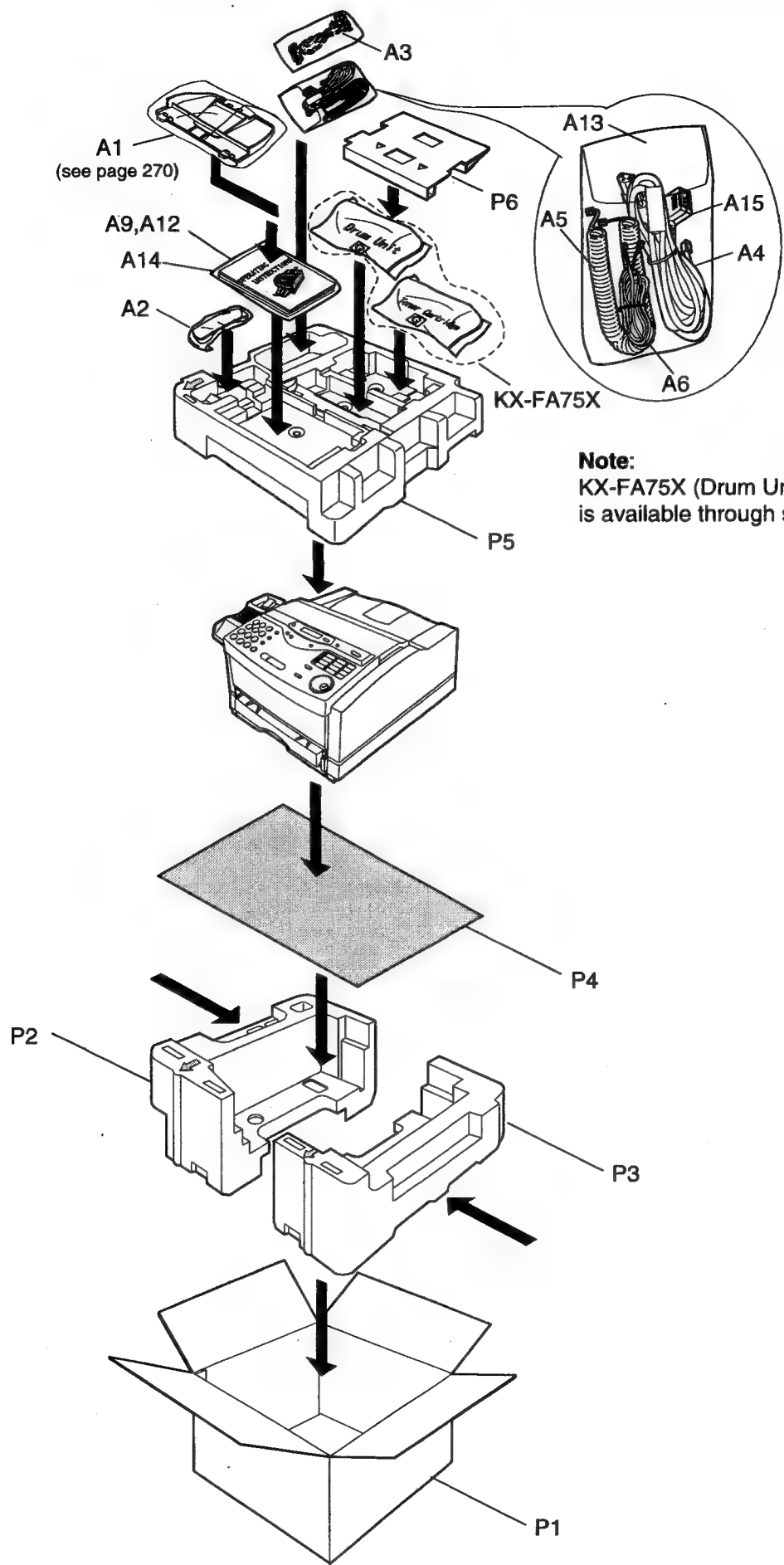


PARTS LOCATION

7. MAIN FRAME SECTION



ACCESSORIES AND PACKING MATERIALS



Note:
KX-FA75X (Drum Unit and Toner Cartridge)
is available through sales route of Panasonic.

PARTS LOCATION

KX-FLM600G

This replacement parts list is for KX-FLM600G only. Refer to the simplified manual (cover) for other areas.

REPLACEMENT PARTS LIST

Model KX-FLM600G

Notes:

- The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

2. Important safety notice.

Components identified by Δ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

- The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS

Unless otherwise specified.

All resistors are in ohms () k=1000 , M=1000k

All capacitors are in MICRO FARADS (μ F) P= μ F

*Type & Wattage of Resistor

Type

ERC:Solid	ERX:Metal Film	PQRD:Carbon
ERD:Carbon	ERG:Metal Oxide	PQRQ:Fuse
PQ4R:Chip	ERO:Metal Film	ERF:Wire Wound

Wattage

10,16,18:1/8W	14,25,S2:1/4W	12,50,S1:1/2W	1:1W	2:2W	5:5W
---------------	---------------	---------------	------	------	------

ECFD:Semi-Conductor	ECCD,ECKD,PQCBC,PQVP : Ceramic
ECQS:Styrol	ECQM,ECQV,ECQE,ECQU,ECQB : Polyester
PQCBX,ECUV:Chip	ECEA,ECSZ,ECOS : Electrolytic
ECMS:Mica	EQQP : Polypropylene

Voltage

ECQ Type	ECQG	ECSZ Type	Others	
ECQV Type				
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

Ref. No.	Part No.	Part Name & Description	Pcs
----------	----------	-------------------------	-----

CABINET / MECHANICAL / ELECTRICAL PARTS

(1. GENERAL SECTION)			
10	C60-02830	Spacer, Sub Frame 2	2
11	C60-19080	Cover, Connector	2
12	620-06070	Connector, Laser Driver	1
13	PFWEFLM600M	Laser Scan Unit	1
14	620-06130-01	Connector, Polygon Motor	1
15	C60-00850	Spacer, One Way	1
16	PFHR1125Z	Guide, B	1
17	PFMD1036Z	Frame, Bottom	1
18	620-06020	Connector, CIS(2)	1
19	PFHR1124Z	Guide, A	1
20	C60-02140	Guide, Rail Board	1
21	C60-01090	Cover, ROM	1
22	B003-00011	Clamper	1
23	C60-10060	Frame	1
24	700-006A	AC Soket	1
25	C62-99010	Brush,Anti-Static	2
26	B003-00010	Clamper	1
27	C62-18630	Spacer	2
28	620-06080	Lead Wire	1
29	PFQT1577Z	LLabel,Laser Caution	1

Ref. No.	Part No.	Part Name & Description	Pcs
(2. OPERATION PANEL SECTION)			
101	PFBE1003Z5	Knob, Jog Dial	1
102	PFHX1117Y	Spacer, Jog Dial	1
103	PFGV1008Z	Transparent Plate	1
104	PFGD1042X	Sheet, Tel Card	1
105	PFYFLM600G	Grille, Operation	1
106	PFBX1076Y1	Button, Menu	1
107	PFBX1075Z1	Button, Volume	1
108	PFBX1074Z1	Button, One Touch	1
109	PFAVJS10101	LCD	1
110	PFBC1033Z1	Button, Start	1
111	PFBC1034Z1	Button, Stop	1
112	PFGP1134Z	Cover, LED	1
113	PFBC1035Z1	Button, Help	1
114	PFBX1073Z1	Button, 16(Dial)	1
115	620-06200	Connector, Ope. Panel	2
116	PFDE1092Z	Lever, Doc. Detection	1
117	C60-19700	Cover, Panel Stopper	2
118	C60-01110-WA	Cover, Scan Upper	1
119	C60-01190	Guide, Retard Pad	1
120	C60-10540	Plate Spring, ADF Set	1
121	C60-18120	Rubber, Separator	1
122	C60-00710	Clamper, Retard Pad	1
123	C60-10500	Angle, Doc Eject Idle Roller	2
124	C60-05270	Roller, Doc Eject Idle	2
125	C60-35010	Coil Spring, ADF	1
126	C60-14090	Shaft, Feed Idle	1
127	C60-05260	Roller, Scan Feed Idle	2
128	C60-10560	Plate Spring, Feed Roller	1
129	PFKE1011X1	Cover, Front	1
130	PFGP1135W	Panel, LCD Panel	1
131	C62-99020	Brush, Paper Earth	1
132	C62-91220	Cover, Eject	1
133	C62-91210	Cover, Paper Earth	1
(3. SUB FRAME SECTION 1)			
201	C60-35070	Coil Spring, OPC Cover	2
202	C60-01140	Cover, Cushion	2
203	C60-10580	Plate Spring, OPC	2
204	PFQT1494Z	Label, High Temp. Warning	1
205	C60-02020	Frame, Heat Fixing	1
206	C60-01040	Cover, Electrode	1
207	C60-15110	Roller, Exit	2
208	C60-02610	Shaft, Exit Roller	1
209	627-00020	Fuser, Thermo	2
210	C60-10210	Angle, Electrode AC LH	1
211	C60-10380	Angle, Electrode Heat Roller GND	1
212	627-00010	Thermistor	1
213	PFJT1012Z	Angle, Electrode AC Middle 1	1
214	PFJT1013Z	Angle, Electrode AC Middle 2	1
215	C60-10440	Angle, Electrode AC RH	1
216	C60-00920	Spacer, Heat Roller RH	1
217	C60-00910	Spacer, Heat Roller LH	1
218	C60-00660	Gear, Heat Roller	1
219	PFDR1010Z	Roller, Heat	1
220	626-10020	Lamp, Halogen	1
221	C60-01130	Cover, Heat Fixing	1
222	C60-00350	Gear, Exit Idle	1
223	C60-10490	Angle, Paper Stacking	2
224	C60-10330	Angle, Electrode High Voltage	1
225	C60-00900	Spacer, Back Up Roller	2
226	C60-35040	Coil Spring, Back Up Roller	2
227	C60-15350	Roller, Back Up	1
228	C60-17060	Spacer, Paper Stacking	2
229	C60-19230	Sheet, Manual Guide	2

This replacement parts list is for KX-FLM600G only. Refer to the simplified manual (cover) for other areas.

PARTS LOCATION

KX-FLM600G

This replacement parts list is for KX-FLM600G only. Refer to the simplified manual (cover) for other areas.

Ref. No.	Part No.	Part Name & Description	Pcs	Ref. No.	Part No.	Part Name & Description	Pcs
508	C60-19160	Cover, Cassette GND	1			(SCREWS/WASHERS/E-RINGS)	
509	PFQT1496Z	Label, Upper Limit	2	A	XTW3+S8M	Screw	S 44
510	C60-02130-WA	Guide, Paper Right	1	B	XTB3+6G	Screw	S 30
511	C60-14080	Shaft, Manual Back Up	2	C	B000-82006	Screw	1
512	C60-05240	Roller, Manual Back Up	2	D	XTB26+5G	Screw	S 3
513	C60-35220	Plate Spring	2	E	XSB3+5	Screw	S 5
514	C60-01650-WA	Angle, Separation	1	F	XSB3+6FN	Screw	S 1
515	C60-18140	Pad, Separation	1	G	XTB3+30G	Screw	S 2
516	C60-10430	Angle, Pad GND	1	H	B000-82605	Screw	4
517	C60-01640-WA	Cover, Pad Saper.	1	I	B000-22003	Screw	1
518	C60-35230	Spring, Pad	1	J	XSB26+5	Screw	S 1
519	PFDE1091Z	Lever, Paper Indicator	1	K	B000-6300610	Screw	1
520	C60-35300	Spring, Lift L	1	L	B000-6300815	Screw	2
521	C60-01670	Bracket, Lift	1	M	B000-6300850	Screw	9
522	C60-35310	Spring, Lift R	1	N	B000-6300865	Screw	2
523	PFMD1035Z	Cover, Paper Cassette B Cover	1	P	B000-6301015	Screw	2
		(7. MAIN FRAME SECTION)		Q	B000-6401050	Screw	1
601	M60-62610	Fan Ass'y	1	R	B000-6301215	Screw	2
602	Not Used			S	B000-1300851	Screw	3
603	Not Used			T	B000-6301050	Screw	1
604	C60-10010	Angle, SMPS GND	1	U	XTB4+10G	Screw	S 3
605	C60-02010	Chassis, Engine	1	V	XTW26+8	Screw	S 15
606	C60-10300	Angle, Electrode OPC	1	W	XTB3+10G	Screw	S 5
607	C60-10290	Angle, Electrode DVP	2	Y	B000-8300801	Screw	2
608	C60-14520	Pin, Electrode	4	Z	XYN3+C8FNS	Screw	S 6
609	Not Used			E1	XUC3FY	E-Ring	S 1
610	C60-10310	Angle, Electrode Transfer	1	E2	XUC4FY	E-Ring	S 3
611	C60-10400	Angle, Electrode Counter	1	E3	XUC6FY	E-Ring	S 1
612	C60-10480	Angle, Hinge DVP	1	W1	B000-04040	Washer	1
613	C60-02150	Guide, Cassette L	1	a	XYC3+FF6	Screw	S 6
614	C60-18210	Foot, Base	2	b	B000-73006	Screw	3
615	C60-02330	Lever, Toner Sensor Frame	1	d	B000-82008	Screw	2
616	C60-00870	Spacer, Pick Up	2	e	B000-8300802	Screw	4
617	C60-01350	Lever, Paper Sensor	1	f	XSB4+6	Screw	S 1
618	M60-14010	Pick Up & Register Roller Ass'y	1			ACCESSORIES AND PACKING MATERIALS	
619	C60-02050	Chassis, Pick Up	1	A1	PFZXFLM600G	Paper Tray Ass'y	1
620	C60-35240	Spring, Pick Up	1	A1-1	PFQT1579Z	Label	1
621	C60-01330	Lever, Clutch	1	A1-2	C62-02920-E1	Tray, Manual Extend	1
622	C62-19770	Sheet, Feed Roller	2	A1-3	C62-18620	Rubber, Paper Tray	2
623	C60-01370	Lever, Solenoid	1	A2	PFJXE0305Z	Handset	1
624	625-00030	Solenoid, Pick Up	1	A3	PFJA1031Z	Printer Cable	1
625	C60-10240	Angle, Solenoid	1	A4	PQJA10038Y	Power Cord	△ 1
626	C60-02160	Guide, Cassette R	1	A5	PFJA1029Z	Handset Cord	1
627	C60-18220	Foot, Base Rear	2	A6	PFJA1005Z	Telephone Line Cord	△ 1
628	C60-00850	Spacer, One Way	1	A7	Not used		
629	B000-00870	Washer, One way	2	A8	Not used		
630	C60-14510	Pin, Shaft Pick Up	1	A9	PFQX1354Z	Instruction Book	1
631	C60-00500	Gear, OPC DVP Drive	1	A10	Not used		
632	C60-14070	Shaft, One Way	1	A11	Not used		
633	B000-04060	Washer, DVP Drive Frame	1	A12	PFJK201A5131	CD-ROM	1
634	C60-00680	Gear, One Way Clutch	1	A13	XZB15X40A04	Bag	1
635	C60-01680	Chassis, Drive Sub	1	A14	XZB26X35A04	Bag	1
636	C60-00290	Gear, DVP Drive Frame	1	A15	PFJA1010Z	Card, TEL.Socket adaptor	1
637	B000-00880	Washer, DVP Drive Frame 2	1	P1	PFPPK1567Z	Packing Case	1
638	C60-00490	Gear, OPC Drive Frame	1	P2	PFPPN1173Z	Cushon, L	1
639	B000-04050	Washer, DVP Drive Frame	1	P3	PFPPN1174Z	Cushon, R	1
640	C60-00860	Spacer, Pick Up FR	1	P4	PFPPH1020Z	Sheet	1
641	C60-00400	Gear, Feeder	1	P5	PFPPN1181Z	Cushon, Top	1
642	C60-10420	Angle, GND OPC	1	P6	PFPPD1078Z	Cushon	1
643	C60-00370	Gear, Fax Idle 1	1				
644	C60-00380	Gear, Fax Idle 2	2				
645	C60-01360	Actuator	1				
646	C60-14550	Weight	1				

This replacement parts list is for KX-FLM600G only. Refer to the simplified manual (cover) for other areas.

Ref. No.	Part No.	Part Name & Description	Pcs	Ref. No.	Part No.	Part Name & Description	Pcs
DIGITAL BOARD PARTS				C862-834	ECUV1C104KBV	0.1	S 3
PCB1	PFWP1FLM600G	DIGITAL BOARD ASS'Y(RTL)	1	C865	ECEV0JA101	100	1
		(ICs)		C866,867	ECUV1C104KBV	0.1	S 2
IC802	PFVIR676811	IC	1	C868	ECUV1H150JCV	15P	1
IC804	PFVIMS5178JG	IC	1	C869	ECUV1C104KBV	0.1	S 1
IC805	PQVICX58257C	IC	S 1	C870	ECUV1H120JCV	12P	1
IC806	PFVIMM1385EN	IC	1	C871-874	ECUV1C104KBV	0.1	S 4
IC807	PFVIM66410G1	IC	1	C876	ECUV1C104KBV	0.1	S 1
IC808	PFWIFLM600G	IC	1	C877	ECUV1C224ZFB	0.22	1
IC809	PFVIS80842AN	IC	1	C878-885	ECUV1C104KBV	0.1	S 8
IC810	PFVITVT245FT	IC	1	C887	ECUV1H102KBV	0.001	1
IC811	AN6383SB	IC	1	C888	ECUV1C104KBV	0.1	S 1
IC812	PQVINJM2113M	IC	1	C889	ECUV1H332KBV	0.0033	1
		(TRANSISTORS)		C890	ECEA0JK221	220	S 1
Q800	2SD1921Q	TRANSISTOR(SI)	1	C891	ECUV1C104KBV	0.1	S 1
Q801	2SC4155R	TRANSISTOR(SI)	1	C896	ECUV1H103KBV	0.01	1
Q802	2SB1197K	TRANSISTOR(SI)	1	C901,904	ECUV1C104KBV	0.1	2
Q803	2SC4155R	TRANSISTOR(SI)	1	C905,906	ECUV1H102KBV	0.001	2
Q805	2SC4155R	TRANSISTOR(SI)	1	C907	ECUV1H101JCV	100P	1
Q804	PQVTDTC114EU	TRANSISTOR(SI)	1	C908	ECUV1H330JCV	33P	1
		(DIODES)		C909,910	ECUV1C104KBV	0.1	2
DA800	MA141WK	DIODE(SI)	1	C911	ECUV1H223KBV	0.022	S 1
D800	RLS71	DIODE(SI)	1	C912	ECEA1CK101	100	S 1
		(BATTERY)		C913	ECUV1H121JCV	120P	1
BAT800	PQPCR2032H09	LITHIUM BATTERY	S 1	C914,916	ECUV1C104KBV	0.1	2
		(CONNECTORS)		C917	ECEA0JK221	220	S 1
CN800,801	PFJP18A24Z	CONNECTOR	2	C918	ECUV1C104KBV	0.1	S 1
CN802	PFJP26A25Z	CONNECTOR	1	C919	ECEA1HKS100	10	S 1
		(CAPACITORS)		C920	ECUV1H821KBV	820P	1
C800,801	ECUV1C104KBV	0.1	S 2	C921	ECUV1H181JCV	180P	1
C802,803	ECEV1HA100	10	2	C922	ECUV1C104KBV	0.1	1
C804,805	ECUV1C104KBV	0.1	S 2	C923	ECUV1C473KBV	0.047	1
C806	PQCUV1H105JC	1	S 1	C924	ECUV1C104KBV	0.1	1
C807	ECUV1C104KBV	0.1	S 1	C928	ECEA1CK101	100	S 1
C808	PQCUV1H105JC	1	S 1	C929	ECUV1H472KBV	0.0047	1
C809	ECUV1C104KBV	0.1	S 1	C930	ECUV1C334ZFB	0.33	1
C818	ECUV1H110JCV	11P	1	C932,935	ECUV1A105ZFB	1	2
C819	ECUV1H120JCV	12P	1	C934-946	ECUV1C104KBV	0.1	S 3
C820	ECUV1C104KBV	0.1	S 1	C937	ECUV1H102KBV	0.001	1
C821	ECEV1HA100	10	1	C944	ECUV1C104KBV	0.1	S 1
C822	ECUV1H330JCV	33P	1				
C823	ECEA1HKS100	10	S 1			(COILS & CERAMIC FILTERS)	
C824	ECUV1C104KBV	0.1	S 1	L800	PQLQR2BT	COIL	S 1
C836	ECUV1H100DCV	10P	S 1	L803	PQLQR2BT	COIL	S 1
C837	ECUV1H150JCV	15P	1	L805,806	PQLQR1ET	COIL	2
C838,839	ECUV1C104KBV	0.1	S 2	L807	PFVF2B222ST	CERAMIC FILTER	1
C841	PQCUV1H104ZF	0.1	1	L808,809	PFVF2B222SDT	CERAMIC FILTER	2
C842	ECEA1HKS010	1	S 1	L812	PQLQR2BT	COIL	S 1
C843,844	ECUV1H222KBV	0.0022	2	L815	PFVF2B222ST	CERAMIC FILTER	1
C845	ECUV1C104KBV	0.1	S 1	R884,885	PFVF1B252SDT	CERAMIC FILTER	2
C846	ECUV1C104KBV	0.1	S 1	R886	PFVF2B272ST	CERAMIC FILTER	1
C847	ECUV1H330JCV	33P	1	R887,888	PFVF1B252SDT	CERAMIC FILTER	2
C848,849	ECUV1C104KBV	0.1	S 2			(RESISTORS)	
C850,851	ECUV1H270JCV	27P	2	F1,2	ERJ6GEY0R00	0	2
C852,853	ECUV1H150JCV	15P	2	J800	ERJ3GEY0R00	0	1
C854	ECEA1EKA330B	33	1	L801,802	ERJ6GEY0R00	0	2
C857	ECEA1HKS100	10	S 1	L804	ERJ6GEY0R00	0	1
C858	PQCUV1H104ZF	0.1	1	C940	ERJ3GEY0R00	0	1
C859	ECUV1C104KBV	0.1	S 1	R800,807	ERJ3GEYJ103	10K	2
				R808	ERJ3GEYJ272	2.7K	1
				R809	ERJ3GEYJ102	1K	1
				R811	ERJ3GEYJ331	330	1
				R812	ERJ3GEYJ472	4.7K	1

KX-FLM600G

This replacement parts list is for KX-FLM600G only Refer to the simplified manual (cover) for other areas.

Ref. No.	Part No.	Part Name & Description	Pcs	Ref. No.	Part No.	Part Name & Description	Pcs
R817	ERJ3GEYJ203	20K	1	R948	ERJ3GEYJ101	100	1
R822	ERJ3GEYJ103	10K	1	R949~952	ERJ3GEYJ103	10K	4
R823	ERJ3GEYJ222	2.2K	1	R953	ERJ3GEYJ4R7	4.7	1
R828	ERJ3GEYJ470	47	1	R954	ERJ3GEYJ102	1K	1
R829	ERJ3GEYJ103	10K	1	R955	ERJ3GEYJ332	3.3K	1
R830	ERJ3GEYJ101	100	1	R956	ERJ3GEYJ473	47K	1
R831	ERJ3GEYJ105	1M	1	R957	ERJ3GEYJ564	560K	1
R832,833	ERJ3GEYJ101	100	2	R958	ERJ3GEYJ221	220	1
R834,835	ERJ3GEYJ103	10K	2	R962	ERJ8GEYJ8R2	8.2	1
R836,837	ERJ3GEYJ101	100	2				
R838	ERJ3GEY0R00	0	1			(COMPONENTS COMBINATION)	
R840,841	ERJ3GEY0R00	0	2	RA800,801	EXRV8V471JV	RESISTOR ARRAY	2
R847	ERJ3GEYJ472	4.7K	1	RA802,803	EXRV8V470JV	RESISTOR ARRAY	2
R848,849	ERJ3GEYJ101	100	2	RA804,805	EXRV8V101JV	RESISTOR ARRAY	2
R850	ERJ3GEYJ472	4.7K	1	RA806,807	EXRV8V000JV	RESISTOR ARRAY	2
R851	ERJ3GEYJ812	9.1K	1	RA808,809	EXRV8V101JV	RESISTOR ARRAY	2
R853,855	ERJ3GEY0R00	0	2	RA810	EXRV8V103JV	RESISTOR ARRAY	1
R856	ERJ3GEYJ472	4.7K	1				
R857	ERJ3GEYJ472	4.7K	1			(CRYSTAL OSCILLATORS)	
R858	ERJ3GEY0R00	0	1	X800	PFVC32256ZAT	CRYSTAL OSCILLATOR	1
R859	ERJ3GEYJ472	4.7K	1	X801	PFVCCSA24Z	CRYSTAL OSCILLATOR	1
R860	ERJ3GEYJ103	10K	1	X802	PFVCCFS32Z	CRYSTAL OSCILLATOR	1
R861	ERJ3GEYJ103	10K	1				
R862~864	ERJ3GEYJ101	100	3				
R865	ERJ3GEYJ222	2.2K	1				
R866	ERJ3GEYJ122	1.2K	1				
R867	ERJ3GEYJ221	220	1				
R868	ERJ3GEYJ122	1.2K	1				
R869	ERJ3GEYJ821	820	1				
R870~872	ERJ8GEY0R00	0	3				
R874	ERJ8GEY0R00	0	1				
R876	ERJ3GEYJ103	10K	1				
R877	ERJ3GEYJ101	100	1				
R879	ERJ3GEYJ472	4.7K	1				
R880	ERJ3GEYJ103	10K	1				
R881	ERJ3GEYJ101	100	1				
R882	ERJ3GEYJ472	4.7K	1				
R883	ERJ3GEYJ102	1K	1				
R889	ERJ3GEYJ102	1K	1				
R890	ERJ3GEYJ102	1K	1				
R891~898	ERJ3GEYJ101	100	8				
R910	ERJ3GEYJ222	2.2K	1				
R912	ERJ3GEYJ472	4.7K	1				
R917,918	ERJ3GEYJ473	47K	2				
R919	ERJ3GEYJ103	10K	1				
R920	ERJ3GEYJ563	56K	1				
R921	ERJ3GEYJ823	82K	1				
R922	ERJ3GEY0R00	0	1				
R923	ERJ3GEYJ103	10K	1				
R924	ERJ3GEYJ334	330K	1				
R925	ERJ3GEYJ562	5.6K	1				
R927	ERJ3GEYJ244	240K	1				
R928	ERJ3GEYJ183	18K	1				
R929	ERJ3GEYJ683	68K	1				
R930	ERJ3GEYJ154	150K	1				
R931	ERJ3GEYJ103	10K	1				
R932	ERJ3GEYJ224	220K	1				
R933	ERJ3GEYJ224	220K	1				
R934	ERJ3GEYJ124	120K	1				
R935~937	ERJ3GEYJ101	100	3				
R938	ERJ3GEYJ153	15K	1				
R939	ERJ3GEYJ393	39K	1				
R940	ERJ3GEYJ102	1K	1				
R941,942	ERJ3GEYJ103	10K	2				
R944	ERJ3GEYJ4R7	4.7	1				
R945	ERJ3GEYJ103	10K	1				

This replacement parts list is for KX-FLM600G only. Refer to the simplified manual (cover) for other areas.

Ref. No.	Part No.	Part Name & Description	Pcs	Ref. No.	Part No.	Part Name & Description	Pcs
ANALOG BOARD PARTS				C634	ECUV1C273KBV	0.027	1
				C635	ECEA0JU331	330	1
				C636-638	ECUV1C104KBV	0.1	3
				C640	ECUV1H331JCV	330P	1
				C642,643	ECUV1C104KBV	0.1	2
				C644	PQCUV1C224KB	0.22	1
				C645	PQCUV1C334KB	0.33	1
				C646	PQCUV1E563MD	0.056	1
				C647	ECUV1H103KBV	0.01	1
				C648	ECEA1CKS470	47	1
				C649	ECUV1H103KBV	0.01	1
				C650	ECUV1C104KBV	0.1	1
				C651	ECEA1CKS100	10	1
				C652	ECUV1C104KBV	0.1	1
				C653,654	ECUV1H181JCV	180P	2
				C657	ECUV1H103KBV	0.01	1
				C658	ECEA1CKS100	10	1
				C659	ECUV1H103KBV	0.01	1
				C660,661	ECUV1H102KBV	0.001	2
				C662	ECUV1C104KBV	0.1	1
				C663	PQCUV1C224KB	0.22	1
				C664,665	ECUV1C104KBV	0.1	2
				C666	ECUV1H221JCV	220P	1
				C667,668	ECUV1C104KBV	0.1	2
				C669	ECEA0JU331	330	1
				C670	ECEA1CKS100	10	1
				C671	ECUV1H333KDV	0.033	1
				C672,673	ECUV1C273KBV	0.027	2
				C674	ECUV1H333KDV	0.033	1
				C680	ECEA1HN330S	33	1
				C689	ECUV1H392KBV	0.0039	1
				C690	ECUV1C104KBV	0.1	1
				C692	ECUV1H222KBV	0.0022	1
				C693	ECUV1C104KBV	0.1	1
				C694	ECUV1H821KBV	820P	1
				C695	ECUV1H332KBV	0.0033	1
				C696	ECUV1H472KBV	0.0047	1
				C697	ECUV1H223KBV	0.022	1
				C698	ECUV1C104KBV	0.1	1
				C699	ECUV1H392KBV	0.0039	1
				C700	ECUV1H682KBV	0.0068	1
				C701	ECUV1C273KBV	0.027	1
				C702	ECEA1HKS4R7	4.7	1
				C703,704	ECEA1VU331	330	2
				C705	ECUV1E105ZF	1	1
				C711	ECEA1HKS4R7	4.7	1
				(COILS & CERAMIC FILTERS)			
				L600,601	PFVF3A601ST	CERAMIC FILTER	2
				L602	EXCELD35	COMPONENTS PARTS	1
				L603,604	PFVF3A601ST	CERAMIC FILTER	2
				L605-610	PFVF2B272ST	CERAMIC FILTER	6
				L611,612	PQLQXD152K	COIL	2
				L613,614	PFVF2B272ST	CERAMIC FILTER	2
				(PHOTO ELECTRIC TRANSDUCERS)			
				PC601	PQVITLP620K	PHOTO COUPLER	1
				PC602	PQVITLP627	PHOTO COUPLER	1
				PC603,606	0N3131SKU	PHOTO COUPLER	2
				(RELAY)			
				RLY600	ATXD2032B	RELAY	1

KX-FLM600G

This replacement parts list is for KX-FLM600G only. Refer to the simplified manual (cover) for other areas.

Ref. No.	Part No.	Part Name & Description	Pcs	Ref. No.	Part No.	Part Name & Description	Pcs
		(RESISTORS)					
C713,714	ERJ6GEY0R00	0	2	R677	ERJ3GEYJ223	22K	1
J604,605	ERDS2TJ000	0	2	R678	ERJ3GEYJ473	47K	1
J609-611	ERJ3GEY0R00	0	3	R679	ERJ3GEYJ101	100	1
J615	ERDS2TJ000	0	1	R680	ERJ3GEYJ331	330	1
J618,619	ERDS2TJ000	0	2	R681	ERJ3GEYJ474	470K	1
J621,631	ERDS2TJ000	0	2	R682	ERJ3GEYJ124	120K	1
J633-635	ERDS2TJ000	0	3	R683	ERJ3GEY0R00	0	1
J641,645	ERDS2TJ000	0	2	R685-689	ERJ3GEYJ103	10K	5
J648	ERDS2TJ000	0	1	R690	ERJ3GEYJ474	470K	1
J652	ERJ3GEY0R00	0	1	R691,692	ERJ3GEYJ103	10K	2
POS600	ERDS2TJ000	0	1	R693	ERDS1VJ4R7	4.7	1
R600	ERJ3GEYJ103	10K	1	R698,699	ERJ3GEYJ332	3.3K	2
R602	ERDS1TJ183	18K	1	R708	ERJ3GEYJ333	33K	1
R603	ERJ3GEYJ512	5.1K	1	R710	ERJ3GEYJ103	10K	1
R604	ERDS1VJ561	560	1	R711	ERJ3GEYJ153	15K	1
R605	ERDS1VJ5R6	5.6	1	R714	ERJ3GEY0R00	0	1
R607	ERDS1TJ473	47K	1	R715	ERG2SJ821	820	1
R608	ERJ3GEYJ103	10K	1	R716	ERDS2TJ120	12	1
R609	ERJ3GEYJ562	5.6K	1	R717	ERJ3GEYJ561	560	1
R610	ERJ3GEYJ472	4.7K	1	R718	ERJ3GEYJ204	200K	1
R611	ERJ3GEYJ102	1K	1				
R612	ERJ3GEYJ104	100K	1				
R613	ERJ3GEYJ473	47K	1			(VARISTORS)	
R614	ERJ3GEYJ822	8.2K	1	SA600	PQVDRA311PT3	VARISTOR	△ S 2
R615	ERJ3GEYJ474	470K	1	SA601	PFRZ001Z	VARISTOR	△ 1
R616	ERJ3GEYJ105	1M	1	ZNR600	ERZC07DK121	VARISTOR	△ 1
R617	ERJ3GEYJ333	33K	1	ZNR601	ERZC07DK121	VARISTOR	△ 1
R618	ERJ3GEYJ105	1M	1				
R620,621	ERJ3GEYJ223	22K	2			(TRANSFORMERS)	
R624	ERJ3GEYJ101	100	1	T600	PFLT8E004	TRANSFORMER	△ 1
R625	ERJ3GEYJ222	2.2K	1	T601	PFLT8E003	TRANSFORMER	△ 1
R626	ERJ3GEYJ123	12K	1				
R629	ERJ3GEYJ102	1K	1				
R631	ERDS2TJ000	0	1			(TRANSFORMERS)	
R640	ERJ3GEYJ682	6.8K	1	F600	PQBA1N10NAL	FUSE	
R641	PQ4R10XJ182	1.8K	1				
R642	PQ4R10XJ332	3.3K	1				
R643	ERJ3GEYJ242	2.4K	1				
R644	ERDS2TJ000	0	1				
R645	ERJ3GEYJ153	15K	1				
R646	ERJ3GEY0R00	0	1				
R647	ERJ3GEYJ433	43K	1				
R648	ERJ3GEY0R00	0	1				
R649	ERJ3GEYJ334	330K	1				
R650	ERJ3GEYJ561	560	1				
R651	ERJ3GEYJ563	56K	1				
R653	ERJ3GEYJ331	330	1				
R654	ERJ3GEYJ563	56K	1				
R655	PQ4R10XJ332	3.3K	1				
R657	PQ4R10XJ182	1.8K	1				
R658	ERJ3GEYJ331	330	1				
R659	ERJ3GEYJ182	1.8K	1				
R660	ERJ3GEYJ182	1.8K	1				
R661	ERJ3GEYJ153	15K	1				
R662	ERJ3GEYJ114	110K	1				
R663,664	ERJ3GEY0R00	0	2				
R665	ERJ3GEYJ114	110K	1				
R667	ERJ3GEYJ473	47K	1				
R668	ERJ3GEYJ101	100	1				
R670	ERJ3GEYJ473	47K	1				
R671,672	ERJ3GEYJ104	100K	2				
R673	ERJ3GEYJ682	6.8K	1				
R674	ERJ3GEY0R00	0	1				
R675	ERJ3GEYJ333	33K	1				
R676	ERJ3GEYJ433	43K	1				

This replacement parts list is for KX-FLM600G only. Refer to the simplified manual (cover) for other areas.

Ref. No.	Part No.	Part Name & Description	Pcs	Ref. No.	Part No.	Part Name & Description	Pcs
OPERATION BOARD PARTS				SWITCHING MODE POWER SUPPLY BOARD PARTS			
PCB3	P62-62020	OPERATION BOARD ASS'Y (RTL)	1	PCB4	P62-02000	LOW VOLTAGE POWER SUPPLY BOARD ASS'Y(RTL) Δ	1
IC301	MN53007QAF	(IC) IC	1	IC1	PFVIFA5317P	(ICs) IC	1
D301, 302	1SS119	(DIODES) DIODE(SI)	2	IC2	680-002A	IC	1
LED301	PQVDR325CA47	(LEDS) LED	1	IC3	PQVIPC817CD	PHOTO COUPLER	1
LED302	604-00004	LED	1	IC7	PQVINJM2904D	IC	1
C306	ECUV1C104KBV	(CAPACITORS) 0.1	S 1	IC4	IESS001A	(TRANSISTORS&THYRISTOR)) TRANSISTOR(SI)	1
C308	ECUV1H122KBV	0.0012	1	IC8	IEMS002A	TRANSISTOR(SI)	1
C310-313	ECUV1H331JCV	330P	4	Q1	610-008A	TRANSISTOR(SI)	1
C314, 315	ECUV1C104KBV	0.1	2	Q2	680-003A	TRANSISTOR(SI)	1
C317, 322	ECUV1C104KBV	0.1	S 2	Q3	610-005A	THYRISTOR(SI)	1
C326	ECEA1AU101	100	1	Q4	600-014A	TRANSISTOR(SI)	1
CN301	PQJP12G43Y	(CONNECTORS) CONNECTOR, 12P	1	Q5	IDSS004A	TRANSISTOR(SI)	1
CN302	PQJS10X59Z	CONNECTOR, 10P	1	D1	PQVDD3SBA60M	(DIODES) DIODE(SI)	1
CN303	PQJP2G30Y	CONNECTOR, 2P	1	D2	DGI4007A	DIODE(SI)	1
CN304	PQJP3G43Y	CONNECTOR, 3P	1	D3	DGI4P37A	DIODE(SI)	1
CN307	PQJP6G43Y	CONNECTOR, 6P	1	D4	DPC4148A	DIODE(SI)	1
PI301	CNA1006N	(PHOTO ELECTRIC TRANSDUCER) SENSOR	1	D7,8	EPC5248A	DIODE(SI)	2
R306	ERJ3GEYJ563	(RESISTORS) 56K	1	D9	EPC5234A	DIODE(SI)	1
R307	ERJ3GEYJ331	330	1	D10	DGI4004A	DIODE(SI)	1
R308, 309	ERJ3GEYJ102	1K	2	D11	PQVDD10LC20U	DIODE(SI)	1
R324-329	ERJ3GEYJ181	180	6	D13	PQVDD10LC20U	DIODE(SI)	1
R334-337	ERJ3GEYJ181	180	4	D16	DPC4148A	DIODE(SI)	1
R340-343	ERJ3GEYJ181	180	4	D18	DPC4148A	DIODE(SI)	1
R344, 345	ERJ3GEYJ103	10K	2	BD1,2	670-020A	(COILS) BEAD CORE	2
R346, 347	ERJ3GEYJ181	180	2	BD4	670-020A	BEAD CORE	1
R348	ERJ3GEYJ273	27K	1	L1	520-010B	COIL	1
R349	ERJ3GEYJ102	1K	1	L2	520-018A	LINE FILTER	1
R351, 352	ERJ3GEYJ103	10K	2	L4	530-001A	CHOKE COIL	1
R353, 354	ERJ3GEYJ181	180	2	L5	530-002A	CHOKE COIL	1
R355, 356	ERJ3GEYJ471	470	2	L6	530-009A	COIL	1
SW301-334	EVQ11Y05B	(SWITCHES) SWITCH	35	CN1	630-068A	(CONNECTORS) CONNECTOR	1
SW336,337	EVQ11Y05B	SWITCH	2	CN2	630-003A	CONNECTOR	2
SW339	EVQ11Y05B	SWITCH	1	CN3	630-032A	CONNECTOR	1
SW342, 343	EVQ11Y05B	SWITCH	2	CN4	630-003A	CONNECTOR	1
SW350	PFSR12A01Z	JOG SWITCH	1	C1	CX00007B	(CAPACITORS) 0.1	1
				C2	CX00007B	0.1	1
				C3,4	CCX0002B	2200P	2
				C5	CK103ZSA	0.01	1
				C6	CG104ZGA	0.1	1
				C7	CCX0012A	0.0047	1
				C9	CE107MQG	100	1
				C10	CQ104KKA	0.1	1
				C12	CLX006A	0.22	1
				C13	CQ102JGA	1000P	1
				C14	CE226MGL	22	1
				C15	CQ103KKA	0.01	1

KX-FLM600G

This replacement parts list is for KX-FLM600G only. Refer to the simplified manual (cover) for other areas.

Ref. No.	Part No.	Part Name & Description	Pcs	Ref. No.	Part No.	Part Name & Description	Pcs	
C16	CQ223KZB	0.022	1	VR1	660-012A	(VARISTORS)	1	
C17	CCX0012A	0.0047	1			VARISTOR		
C18	CE476MGL	4.7	1					
C19	CE108MAL	1000P	1					
C20	CE227MEJ	220	1	HIGH VOLTAGE POWER SUPPLY BOARD PARTS				
C21	CE227MEL	220	1	PCB5	P62-64020	HIGH VOLTAGE POWER	1	
C24	CE338MAL	3300	1			SUPPLY BOARD ASS'Y(RTL)		
C25	CE108MFL	1000	1					
C26,27,28	CK102KUA	1000P	3					
C29	CE477MFL	470	1	U101	170-00043	(IC)	1	
C30	CG104ZGA	0.1	1			IC		
C31	CK470KUA	47P	1			IC		1
C32,34	CG104ZGA	0.1	2					
C33	CK101KUA	100P	1	SW101	PQVIMC4066BP			
C35	CK102KUA	1000P	1					
C40	CE227MEJ	220	1					
F1	640-027B	(FUSE) FUSE	1	Q101	210-00025	(TRANSISTORS) TRANSISTOR(SI)	1	
			1	Q102	210-00026	TRANSISTOR(SI)	1	
				Q103~105	210-00007	TRANSISTOR(SI)	3	
				Q201	210-00024	TRANSISTOR(SI)	1	
			1	Q202,203	210-00007	TRANSISTOR(SI)	2	
				Q301	210-00024	TRANSISTOR(SI)	1	
		(RESISTORS)		Q302,303	210-00007	TRANSISTOR(SI)	2	
R1	ERDS1TJ474	470K	1	Q401	210-00024	TRANSISTOR(SI)	1	
R2	ERDS1TJ121	120	1	Q402~406	210-00007	TRANSISTOR(SI)	5	
R3	ERDS1TJ101	100	1					
R4	ERDS1TJ181	180	1					
R5	ERDS1TJ104	100K	1					
R6	RX00039B	0.15	1			(DIODES)		
R7	RC392FDA	3.9K	1	D101,102	260-00002	DIODE(SI)	2	
R8	ERDS1TJ101	100	1	D103	260-00001	DIODE(SI)	1	
R9	ERDS1TJ220	22	1	D104,105	260-00002	DIODE(SI)	2	
R11	ERDS1TJ101	100	1	D106	260-00002	DIODE(SI)	1	
R12	ERDS1TJ151	150	1	D201~204	260-00002	DIODE(SI)	4	
R13	RD274JFC	270K	1	D205,206	260-00030	DIODE(SI)	1	
R14	ERDS1TJ123	12K	1	D301~304	260-00002	DIODE(SI)	4	
R15	RD473JHA	47K	1	D305	260-00030	DIODE(SI)	1	
R16	ERDS1TJ123	12K	1	D402~404	260-00002	DIODE(SI)	3	
R18	ERDS1TJ152	1.5K	1	D405	260-00030	DIODE(SI)	1	
R19	ERDS1TJ820	82	1	D407	260-00002	DIODE(SI)	1	
R20	ERDS1TJ222	2.2K	1	ZD101	270-20001-12	DIODE(SI)	1	
R21	RC302FDA	3K	1	ZD102	270-20001-15	DIODE(SI)	1	
R22	RCX0024A	3.25K	1	ZD201,202	270-20001-43	DIODE(SI)	2	
R23	ERDS1TJ102	1K	1	ZD301,302	270-20001-43	DIODE(SI)	2	
R24,30	RC223FDA	22K	2	ZD402,403	270-20001-43	DIODE(SI)	2	
R25	RD820JFC	82	1					
R29	RX00036A	0.02	1					
R31,34	RC222BDA	2.2K	2					
R32	RC502BDA	5K	1			(CAPACITORS)		
R33	RC512BDA	5.1K	1	C101	ECA1VM470	47	1	
R35	ERDS1TJ222	2.2K	1	C102	420-10300	50P	1	
R36	RD102JFC	1K	1	C103	420-10200-50	50P	1	
R37	ERDS1TJ681	680	1	C104	ECA1VM330	33	1	
R38	RC202FDA	2K	1	C105	ECA1HM3R3	3.3	1	
R39	RC373FDA	37K	1	C108	ECA1HM0R47	0.47	1	
				C201	420-10400-50	50P	1	
				C202	420-22200-50	50P	1	
		(TRANSFORMER)		C203,204	ECA1HM3R3	3.3	2	
T1	510-046B	POWER TRANSFORMER	1	C205,206	400-22200-B	10	2	
				C301	420-10400-50	50P	1	
				C302	420-22200-50	50P	1	
		(THERMISTOR)	1	C303,304	ECA1HM3R3	3.3	2	
TH1	620-005A	THERMISTOR	1	C305	400-22200-B	10	1	
				C401	420-10400-50	50P	1	
				C402	420-22200-50	50P	1	

KX-FLM600G

This replacement parts list is for KX-FLM600G only. Refer to the simplified manual (cover) for other areas.

Ref. No.	Part No.	Part Name & Description	Pcs	Ref. No.	Part No.	Part Name & Description	Pcs
ECN1	530-00120-01	(CONNECTORS) CONNECTOR	1	U201	170-00701	IC	
ECN2	540-00340	CONNECTOR	1			(TRANSISTORS)	
ECN3	530-00050	CONNECTOR	1	Q1	210-00010	TRANSISTOR(SI)	1
ECN4	530-00080	CONNECTOR	1	Q201	210-00023	TRANSISTOR(SI)	1
ECN5	540-00400	CONNECTOR	1			(DIODES)	
ECN6	530-00030-01	CONNECTOR	1	D1	260-00006	DIODE(SI)	1
ECN7	530-00100	CONNECTOR	1	D2~18	270-00020	DIODE(SI)	17
ENC8	540-00260	CONNECTOR	1			(CAPACITORS)	
PC1	613-00040	(PHOTO ELECTRIC TRANSDUCER) PHOTO COUPLER	1	C1-5	PQCUV1H104ZF	0.1	5
		(RESISTORS)		C6	PQCUV1H102J	0.001	S 1
R1~7	ERD25TJ102	1K	7	C7	PQCUV1H101JC	100P	1
R8, 9	ERD25TJ103	10K	2	C8~22	PQCUV1H102J	0.001	15
R10	ERD25TJ272	2.7K	1	C23, 24	PQCUV1H150JC	15P	S 2
R11	ERD25TJ100	10	1	C25, 26	PQCUV1H221JC	220P	1
R12, 13	ERD25TJ563	56K	2	C27	PQCUV1H103KB	0.01	1
R14	ERD25TJ222	2.2K	1	C28	PQCUV1H102J	0.001	S 1
R15	ERD25TJ332	3.3K	1	C29~31	PQCUV1H221JC	220P	3
R16	ERD25TJ223	22K	1	C32	PQCUV1H104ZF	0.1	1
R17	ERD25TJ102	1K	1	C33, 34	PQCUV1H150JC	15P	1
R18	ERD25TJ472	4.7K	1	C35, 36	PQCUV1H180JC	18P	1
R19	ERD25TJ271	270	1	C37	PQCUV1H150JC	15P	1
R20	ERD25TJ105	1M	1	C38~40	PQCUV1H104ZF	0.1	3
R21	ERD25TJ203	20K	1	C41, 42	PQCUV1H150JC	15P	2
R22	ERD25TJ103	10K	1	C43~62	PQCUV1H104ZF	0.1	20
R23	ERD25TJ333	33K	1	C64~70	PQCUV1H104ZF	0.1	7
R24	ERD25TJ103	10K	1	C71	PQCUV1H221JC	220P	1
R25	312-12020	123K	1	C72	PQCUV1H150JC	15P	1
R26	ERD25TJ102	1K	1	C73	PQCUV1H470JC	47P	1
R27	323-75000	750	1	C75	PQCUV1H104ZF	0.1	1
R28~31	ERD25TJ102	1K	4	C77, 78	PQCUV1H104ZF	0.1	2
R32	ERD25TJ332	3.3K	1	C201,202	450-10400-YZ	0.1	2
R34	ERD25TJ332	3.3K	1				
R35	ERD25TJ102	1K	1	CT1~3	470-22600	22	3
R36	ERD25TJ513	51K	1	CT4~9	470-10500	1	6
R37	ERD25TJ332	3.3K	1	CT10	470-22600	22	1
R38	ERD25TJ104	10K	1	CT11, 12	470-47600	47	2
R39	323-01500	0.15	1	CT13	470-22600	22	1
R40	ERD25TJ102	1K	1				
R41	ERD25TJ751	750	1			(CONNECTORS)	
R42	ERD25TJ332	3.3K	1	J1	530-00480	CONNECTOR	1
R43	ERDS1TJ000	0	1	J4	530-00360	CONNECTOR	1
Y1	608-00040	(CRYSTAL OSCILLATOR) CRYSTAL OSCILLATOR	1	J5	540-00340-01	CONNECTOR	1
PRINTER CONTROL BOARD PARTS				JP1	540-00020-00	CONNECTOR	1
PCB7	P62-63020	PRINTER CONTROL BOARD ASS'Y (RTL)	1	J201	540-00020-00	CONNECTOR	1
		(ICs)		J202	530-00020-03	CONNECTOR	1
U1	110-00611	IC	1			(COILS)	
U2	120-00004	IC	1	L1~18	609-00007	BEAD CORE CHIP	18
U4	120-00031	IC	1	L20	609-00007	BEAD CORE CHIP	1
U5	120-00004	IC	1	L21	609-00004	BEAD CORE	1
U7	120-00031	IC	1	L24	609-00007	BEAD CORE CHIP	1
U9	170-00621	IC	1	L25, 26	609-00009	BEAD CORE CHIP	2
U10	100-00060	IC	1	L201	609-00007	BEAD CORE CHIP	
U12	170-00670	IC	1			(RESISTORS)	
U13	160-00750	IC	1	L22, 23	ERDS1TJ000	0	2
U14	608-00050	IC	1	R1~31	PQ4R10XJ330	33	31
				R33~39	PQ4R10XJ330	33	7
				R40, 42	PQ4R10XJ510	51	2

This replacement parts list is for KX-FLM600G only. Refer to the simplified manual (cover) for other areas.

Ref. No.	Part No.	Part Name & Description	Pcs	Ref. No.	Part No.	Part Name & Description	Pcs
R41	PQ4R10XJ330	33	1	REGISTOR SENSER BOARD PARTS			
R42	PQ4R10XJ510	51	1	PCB8	P60-60010	REGISTOR SENSER BOARD ASS'Y (RTL)	1
R44~47	PQ4R10XJ330	33	4			R-CON	620-06150-01
R48	PQ4R10XJ103	10K	1	R-SEN	613-00040		
R54~56	PQ4R10XJ104	100K	3			PAPER SENSER BOARD PARTS	
R57~88	PQ4R10XJ330	33	32	PCB9	P60-60020	PAPER SENSER BOARD ASS'Y (RTL)	1
R89	PQ4R10XJ103	10K	1			P-CON	620-06110-01
R90~93	PQ4R10XJ3R9	3.9	4	MANUAL-EXIT SENSER BOARD PARTS			
R94, 95	PQ4R10XJ103	10K	2	PCB10	P60-60030	MANUAL-EXIT SENSER BOARD ASS'Y (RTL)	1
R96	PQ4R10XJ330	33	1			M-CON, E-CON	620-06250
R97	PQ4R10XJ103	10K	1	E-SW M-SW	PFSH1A05Z PFSH1A07Z		
R98	PQ4R10XJ472	4.7	1			R.P. SENSER BOARD PARTS	
R99	PQ4R10XJ102	1K	1	PCB11	P62-60070	R.P. SENSER BOARD ASS'Y (RTL)	1
R100	PQ4R10XJ473	47K	1			RP-CON	620-06140-01
R104	PQ4R10XJ562	5.6K	1	RP-SW P-SEN	PFSH1A06Z 613-00040		
R105	PQ4R10XJF392	3.9K	1				
R106-122	PQ4R10XJ102	1K	17				
R123	PQ4R10XJ472	4.7K	1				
R124	PQ4R10XJ102	1K	1				
R125	PQ4R10XJ472	4.7K	1				
R126~136	PQ4R10XJ221	220	11				
R137	PQ4R10XJ102	1K	1				
R138~146	PQ4R10XJ221	220	9				
R147~149	PQ4R10XJ330	33	3				
R150	PQ4R10XJ000	1	1				
R152, 153	PQ4R10XJ330	0	2				
R154~157	PQ4R10XJ104	100K	4				
R158	PQ4R10XJ221	220	1				
R159	PQ4R10XJ104	100K	1				
R160	PQ4R10XJ151	150	1				
R161	PQ4R10XJ330	33	1				
R163~168	PQ4R10XJ473	47K	6				
R170	PQ4R10XJ680	68	1				
R171	PQ4R10XJ180	18	1				
R196	PQ4R10XJ680	68	1				
R201	350-22100	220	1				
R202	350-12000	12	1				
R203	350-10200	1K	1				
Y1	608-00020	(CRYSTAL OSCILLATOR) CRYSTAL OSCILLATOR	1				
JP1	611-25402	(OTHERS) SHORT PIN	1				
BD1	601-00030	EMC FILTER	1				

PARTS LOCATION

KX-FLM600G

This replacement parts list is for KX-FLM600G only. Refer to the simplified manual (cover) for other areas.

Ref. No.	Part No.	Part Name & Description	Pcs
COVER OPEN SENSER BOARD PARTS			
PCB12	P62-60008	COVER OPEN SENSER BOARD ASS'Y (RTL)	1
C-CON	620-06240	(CONNECTOR) CONNECTOR	1
C-SW	PFSH1A06Z	(SWITCH) MICRO SWITCH	1
HOOK BOARD PARTS			
PCB13	P62-60001	HOOK BOARD ASS'Y (RTL)	1
		(JACK & CONNECTOR)	
CN401	PQJJ1TB18Z	MODULAR JACK	1
CN402	PQJP8G30Y	CONNECTOR, 8P	1
CN403	PQJP2G31Y	CONNECTOR, 2P	1
		(SWITCH)	
SW401	ESE14A211	HOOK SWITCH	1
FIXTURES ANT TOOLS			
	PFJF20203128	FLOPPY DISK KIT (for Windws 95/98)	1
	PFJF20303121	FLOPPY DISK (for Windws 3.1X)	1
EC1	PFZZ18K1Z	EXTENSION CORD, 18P	2
EC2	PFZZ40K1Z	EXTENSION CORD, 40P	1
EC3	PFZZ26K1Z	EXTENSION CORD, 26P	1
EC4	PFZZ34K1Z	EXTENSION CORD, 34P	1
EC5	PFZZ12K3Z	EXTENSION CORD, 12P	1
		Note: Extension Cords are useful servicing. (They make servicing easy.)	1
	KM79811245C0	BASIC FACSIMILE TECHNIQUE (for training service technicians)	

EXPLANATION OF CD-ROM SERVICE NUMBER

PFJ K 201 00 10 1
 [1] [2] [3] [4] [5]

FD service number

PFJ F 202 00 10 B
[1] [2] [3] [4] [5]

PFJ **F** **203** **00** **10** **1**
[1] [2] [3] [4] [5]

[1] Media (1 digit of alphabet)

K: CD-ROM

F: FD

[2] Software classification (3 digits of alphanumeric letters)

Interface name (1 digit) + Software classification (2 digits): digits of software classification consists of 1 digit of interface name and 2 digits of software classification.

The classification number of software has its own signification according to the interface name.

*When new software classification code is appeared, the classification number is increased in order.

- Interface name (1 digit of alphanumeric letter): 1 to Z

1: Serial Cable (RS-232C)

2: Parallel Cable (IEEE1284 printer cable)

- Classification of software, OS number, Hardware (2 digits of alphanumeric letters): 00 to ZZ

1: Serial Cable

01: FM220/FM260/FM280, PC FAX software (Windows 3.1x/95)

02: FP300 series. PC FAX software (Windows 95/98)

2: Parallel Cable

01: FLM600 series, printer driver (Windows 3.1x/95/98)

TWAIN driver (Windows 3.1x/95/98)

PC FAX software (Windows 95/98)

02: FLM600 series, printer driver (Windows 95/98)

TWAIN driver (Windows 95/98)

PC FAX software (Windows 95/98)

03: FLM600 series, printer driver (Windows 3.1x)

TWAIN driver (Windows 3.1x)

Example: Parallel Cable (printer cable), FLM600/650 series

Printer driver (Windows 3.1x/95/98)

TWAIN driver (Windows 3.1x/95/98)

PC FAX software (Windows 95/98)

→ 201

KX-FLM600G

[3] Language (2 digits of alphanumeric letters): 00 to ZZ

Language number

- The letters from 0 to 9 are used when single language is supported. Start from 0.
When the right digit becomes full, the left digit counts up.
- The letters from A to Z are used when plural languages are supported. Start from A.
When the right digit becomes full, the left digit counts up.

Assignment table (As of June 7, 1999)

1) Single language

Language code	Language
00	English (U.S.A.)
01	English (U.K.)
02	French (France)
03	German
04	Italian
05	Portuguese
06	Spanish
07	French (Canada)
08	Polish
09	Finnish
0A	Russian
0B	Chinese
0C	English (Canada)

2) Plural languages

Language code	Language
A0	English (U.S.A.) + French (Canada)
A1	German + English (U.K.)
A2	German + English (U.K.) + Polish
A3	German + English (U.K.) + Polish + Portuguese + Spanish
A4	English (U.S.A.) + French (Canada) + German
A5	English (U.S.A.) + French (Canada) + German + English (U.K.) + Italian
A6	English (U.S.A.) + French (Canada) + German + English (U.K.) + Italian + Polish + French (France)
A7	English (U.S.A.) + French (Canada) + German + English (U.K.) + Italian + Polish + French (France) + Spanish + Portuguese

[4] Version (2 digits of alphanumeric letters): 10 to ZZ

Version number

Example: Version 1.0

→ 10

[5] Plural CD-ROM/FD serial numbers (1 digit of alphanumeric letter): 1 to Z

The number of media

1: Disk1	B: Disk11
2: Disk2	C: Disk12
3: Disk3	D: Disk13
4: Disk4	E: Disk14
5: Disk5	F: Disk15
6: Disk6	G: Disk16
7: Disk7	H: Disk17
8: Disk8	J: Disk18
9: Disk9	K: Disk19
A: Disk10	L: Disk20

Example: FD 11 media

→ C

Note: "I" and "O" of alphabet are not used not to be taken for "1" and "0" [zero] of number.